

PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of

**CERTAIN TABLE SAWS INCORPORATING
ACTIVE INJURY MITIGATION TECHNOLOGY
AND COMPONENTS THEREOF**

Inv. No. 337-TA-965

INITIAL DETERMINATION ON VIOLATION OF SECTION 337

Administrative Law Judge Thomas B. Pender

(September 9, 2016)

Pursuant to the Notice of Investigation and Rule 210.42(a) of the Rules of Practice and Procedure of the United States International Trade Commission, this is my Initial Determination in the matter of *Certain Table Saws Incorporating Active Injury Mitigation Technology And Components Thereof*, Investigation No. 337-TA-965.

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PUBLIC VERSION**TABLE OF ABBREVIATIONS**

CDX	Complainants' Demonstrative Exhibit
CIB	Complainants' Initial Post-Hearing Brief
CPB	Complainants' Pre-Hearing Brief
CPX	Complainants' Physical Exhibit
CReplyB	Complainants' Reply Post-Hearing Brief
CRB	Complainants' Responsive Post-Hearing Brief
CX	Complainants' Exhibit
Dep.	Deposition
Hearing Tr.	Hearing Transcript
JX	Joint Exhibit
RDX	Respondents' Demonstrative Exhibit
RIB	Respondents' Initial Post-Hearing Brief
RPB	Respondents' Pre-Hearing Brief
RPX	Respondents' Physical Exhibit
RReplyB	Respondents' Reply Post-Hearing Brief
RRB	Respondents' Responsive Post-Hearing Brief
RX	Respondents' Exhibit
Tr.	Transcript

PUBLIC VERSION**I. INTRODUCTION****A. Procedural Background**

Complainants SawStop, LLC and SD3, LLC (collectively “SawStop” or “Complainants”) filed the complaint underlying this Investigation on July 16, 2015. The complaint alleges Respondents Robert Bosch Tool Corporation and Robert Bosch GmbH (collectively “Bosch” or “Respondents”) import certain products that infringe one or more claims of U.S. Patent No. 7,225,712 (“the ‘712 patent”); 7,600,455 (“the ‘455 patent”); 7,895,927 (“the ‘927 patent”); and 8,011,279 (“the ‘279 patent”) (collectively, “asserted patents”). SawStop amended the complaint on July 30, 2015 in order to assert additional claims from the ‘712 patent.

By publication of a notice in the Federal Register on September 1, 2015, the U.S. International Trade Commission ordered that:

Pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, an investigation be instituted to determine whether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain table saws incorporating active injury mitigation technology and components thereof by reason of infringement of one or more of claims 8, 9, 11, 15, 18, and 20 of the ‘712 patent; claims 1, 5, 7, 10, 13-16, and 18-20 of the ‘455 patent; claims 1, 5, and 16 of the ‘836 patent; claims 7, 8, and 10-12 of the ‘927 patent; claims 1, 5, 6, 10-14, 16, and 17 of the ‘279 patent; and claims 1, 2, 4, 6, 9, and 11 of the ‘450 patent, and whether an industry in the United States exists as required by subsection (a)(2) of section 337;

80 F.R. 52791-2 (Sept. 1, 2015). I set a target date of December 30, 2016 for completion of this investigation and set the evidentiary hearing for April 25, 2016. Order No. 3. On October 1, 2015, I issued the procedural schedule for this investigation. Order No. 4.

In accordance with the procedural schedule, on December 14, 2015, I held a technology tutorial and Markman hearing. On February 9, 2016, I issued Order No. 7, construing certain terms of the asserted patents. In Order No. 7 I construed each of the terms “detection system”, “reaction system”, “control system”, “self-test system”, and “safety system” to have its plain and

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ordinary meaning as understood by one of skill in the art in view of the specification and prosecution history.” (Order No. 7 at 7.) Subsequent to issuing Order No. 7 I requested the parties file supplemental claim-construction briefing, first on the threshold issue of whether any of the “system” limitations are means-plus-function, and second on what structure would correspond to certain of the “system” elements if they were construed under 35 U.S.C. § 112 ¶ 6. On April 29, 2016, I issued a supplemental claim construction order. Order No. 11.

In light of the new constructions in Order No. 11, I rescheduled the evidentiary hearing in this Investigation to allow the parties additional time to engage in further expert discovery to address infringement and invalidity opinions related to those constructions. *See* Order No. 15. On May 9, 2016, the parties submitted their prehearing briefs and prehearing statements. The evidentiary hearing in this investigation was held on May 16 and 23-25, 2016.

The following motions remain pending: SawStop’s motion to strike in part Bosch’s G.R. 7.5 disclosure of invalidity contentions (Motion Docket No. 965-002); SawStop’s motion for summary determination of infringement of certain claims (Motion Docket No. 965-006); SawStop’s motion for summary determination that the domestic industry products practice the Asserted Patents ((Motion Docket No. 965-007); and Bosch’s motion for summary determination of invalidity due to improper functional claiming (Motion Docket No. 965-008). Motion Docket Nos. 965-002, 965-006, 965-007, and 965-008, are hereby Denied.

On August 10, 2016, Bosch filed a motion to re-open the record to add one additional exhibit. (Motion Docket No. 965-024) The exhibit is a table that SawStop allegedly posted to their website after the evidentiary hearing in this investigation comparing the SawStop Jobsite saw to the Bosch REAXX saw. Commission Rule 210.42(g) states that “[a]t any time prior to the filing of the initial determination, the administrative law judge may reopen the proceedings for

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the reception of additional evidence.” 19 C.F.R. § 210.42(g). “However, the proceedings will not be reopened absent a showing of good cause.” *Certain Wireless Devices With 3G and/or 4G Capabilities and Components Thereof*, Inv. No. 337-TA-868, Order No. 113 at 3 (Mar. 31, 2014). I do not find good cause to reopen the record. The evidence Bosch wishes to add was created well after the close of fact discovery and is cumulative of evidence already in the record. In fact, even Bosch admits that “[a] similar comparison chart (RX-220) is in the record.” Accordingly, Motion Docket No. 965-024 is hereby Denied.

B. The Parties

Complainants SawStop, LLC and SD3, LLC are limited liability companies organized and existing under the laws of Oregon. Both companies have a new principal place of business at 11555 SW Myslony Street, Tualatin, Oregon. Amended Complaint at ¶ 6. SD3, LLC owns the Asserted Patents and 100% of SawStop, LLC. *Id.* SawStop, LLC is an operating company that designs, develops, produces and sells table saws with active injury mitigation technology. *Id.*

Respondent Robert Bosch Tool Corporation is a Delaware Corporation with a principal place of business at 1800 West Central Road, Mount Prospect, Illinois, 60056. Response to Complaint at ¶ 17. Respondent Robert Bosch GmbH, the parent of Robert Bosch Tool Corporation, is a German multinational engineering and electronics company located at Robert-Bosch-Platz 1, 70839 Gerlingen-Schillerhöhe, Baden-Wuerttemberg, Germany. *Id.* at ¶ 19.

C. The Asserted Patents and Claims

On February 26, 2016, SawStop filed a motion for partial termination by withdrawal of claim 14 of the ‘279 patent and all asserted claims of the ‘450 patent. That motion was granted by initial determination dated March 10, 2016. *See* Order No. 8 (unreviewed). On April 15,

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2016, SawStop filed a motion for partial termination by withdrawal of claims 7, 13, 14, 15, 18, 19, and 20 of the '455 patent; claims 7, 10, and 11 of the '927 patent; and claims 5, 10, 11, 12, and 13 of the '279 patent. On May 2, 2016, SawStop filed a motion for partial termination by withdrawal of its allegations directed to the '836 patent. These motions were granted by initial determination on May 3, 2016. *See* Order No. 13 (unreviewed).

The asserted patents¹ generally relate to active safety systems for woodworking machines. The following patents and claims remain at issue in this investigation:

Patent Number	Infringement Claims	Domestic Industry Claims
U.S. Patent 7,225,712	8, 9, 11, 15, 18, 20	8, 9, 11, 12, 18, 19, 20
U.S. Patent 7,600,455	1, 5, 10, 16	5, 10, 16
U.S. Patent 7,895,927	8, 12	8
U.S. Patent 8,011,279	1, 6, 16, 17	1, 4, 6, 16, 17

The '712 patent is titled, "Motion Detecting System for Use in a Safety System for Power Equipment." JX-016. It was filed on August 13, 2001, and claims priority to provisional applications filed on August 14, 2000. The '712 patent issued on June 5, 2007. The '712 patent generally describes a woodworking machine safety system that includes a motion detection system or control system that monitors the rotational speed of a cutting tool and triggers a reaction system if the speed presents a dangerous condition to the operator. *See* JX-016 at Abstract. The motion detection system or control system disables the reaction system when the cutting tool has stopped or slowed below a rotational-speed threshold, thereby allowing the operator to contact the cutting tool in order to repair or replace it, or to make measurements between the cutting tool and a fence, for example. *See id.* at 8:1-34. Without the claimed

¹ The effective date of the asserted patents pre-dates the America Invents Act ("AIA") enacted by Congress on September 16, 2011.

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technology, these operations would require the user to disconnect power to the woodworking machine, or otherwise would activate the reaction system unnecessarily.

The '455 patent is titled, "Logic Control for Fast-Acting Safety System." JX-017. It was filed on August 13, 2001, and claims priority to provisional applications filed on August 14, 2000. The '455 patent issued on October 13, 2009. The '455 patent generally describes a woodworking machine safety system that includes a self-test system or control system for monitoring the operation of a reaction system and disabling the machine's motor if the self-test or control system determines that the reaction system is not operational. JX-017 at 7:10-41. In one embodiment, the self-test system determines whether a capacitor stores charge sufficient to actuate the reaction system; if it does not, the self-test system will generate a signal to disconnect the motor, and thereby stop the saw blade from rotating or prevent it from starting. *Id.* at Fig. 4C. The '455 patent further describes reaction systems that include single-use components such as fuse wires and brake pawls, explaining that the self-test system is configured to therefore test the reaction system *without having to operate the reaction system.* *Id.* at 13:8-14:17.

The '927 patent is titled, "Power Equipment with Detection and Reaction Systems." JX-019. It was filed on May 19, 2010, and is a continuation of and claims priority to certain U.S. patent applications, including 10/984,643, filed November 8, 2004, which is a continuation of 09/929,242, filed August 13, 2001. The '927 patent also claims priority to provisional applications filed August 14, 2000. The '927 patent issued on March 1, 2011. The '927 patent generally describes woodworking machine safety systems that include reaction systems designed to retract a cutting tool below a working system within approximately 14 milliseconds after the detection of a dangerous condition. JX-019 at 12:6-13:49. The patent explains that retraction of the saw blade is one of the ways to mitigate injury, provided it occurs quickly enough. The

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specification describes different embodiments for retracting the cutting tool. In one embodiment, angular momentum resulting from a brake engaging the spinning cutting tool retracts the saw blade within approximately 14 milliseconds after detecting a dangerous condition. Another embodiment “direct retraction” that results from a “spring or other force” acting on an arbor that supports the tool such that the blade is retracted without a brake being applied to it. *Id.* at 15:8-16:2; Figs. 10-12.

The ‘279 patent is titled, “Power Equipment with Systems to Mitigate or Prevent Injury.” JX-020. It was filed on December 17, 2007, and is a continuation of and claims priority to U.S. Patent Application No. 09/929,227, filed August 13, 2001. The ‘279 patent also claims priority to provisional applications filed August 14, 2000. The ‘279 patent issued on September 6, 2011. The ‘279 patent describes woodworking safety systems that include an actuator designed to move a moveable component in order to mitigate injury in response to detection of a dangerous condition. JX-020 at Abstract. In some embodiments, the actuator includes a spring and the moveable component includes a brake pawl or arbor block. *Id.* at 8:44-67. In other embodiments, the actuator includes a spring and the moveable component is an arbor block that is used in “direct retraction.” *Id.* at 17:54-18:61; Figs. 30-32. The asserted claims of the ‘279 patent describe specific parameters of the safety system, including the stored energy of the actuator and the distance and time within which the moveable component must move in order to mitigate injury. *Id.* at 8:59-9:58.

D. Products at Issue**1. Domestic Industry Products**

The Domestic Industry Products include four categories of table saws manufactured and sold by SawStop: industrial cabinet saws (ICS), professional cabinet saws (PCS), contractor saws (CNS), and jobsite saws (JSS). Tr. at 476:17-477:20; Order No. 10, ¶ 10. It is undisputed

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that each model of each saw practices the asserted patents in the same way. Tr. at 477:21-478:1
Order No. 10, ¶ 9.

2. Accused Products

The Accused Products are the Bosch GTS1041A REAXX table saw and components thereof, as well as prototype and sample units that have been imported into the United States. 80 Fed. Reg. 52,791; Tr. 339:18-340:21; RPX-2. The Accused Products are also identified as the GTS1041A-09 when sold with a stand, and as the REAXX, Armor Saw or ASAW, which are internal model names. JX-022C at 35:14-38:10, 40:15-41:6.

II. STANDARDS OF LAW**A. Infringement**

“An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the properly construed claims to the device accused of infringing.” *Markman*, 52 F.3d at 976 (citations omitted).

1. Direct Infringement

A complainant must prove either literal infringement or infringement under the doctrine of equivalents. Infringement must be proven by a preponderance of the evidence. *SmithKline Diagnostics, Inc. v. Helena Labs. Corp.*, 859 F.2d 878, 889 (Fed. Cir. 1988). A preponderance of the evidence standard “requires proving that infringement was more likely than not to have occurred.” *Warner-Lambert Co. v. Teva Pharm. USA, Inc.*, 418 F.3d 1326, 1341 n.15 (Fed. Cir. 2005).

a. Literal Infringement

Literal infringement is a question of fact. *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1332 (Fed. Cir. 2008). Literal infringement requires the patentee to prove that the accused

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device contains each and every limitation of the asserted claim(s). *Frank's Casing Crew & Rental Tools, Inc. v. Weatherford Int'l, Inc.*, 389 F.3d 1370, 1378 (Fed. Cir. 2004). If any claim limitation is absent, there is no literal infringement of that claim as a matter of law. *Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 1241, 1247 (Fed. Cir. 2000).

b. Doctrine of Equivalents

Where literal infringement is not found, infringement can still be found under the doctrine of equivalents. Determining infringement under the doctrine of equivalents “requires an intensely factual inquiry.” *Vehicular Techs. Corp. v. Titan Wheel Int'l, Inc.*, 212 F.3d 1377, 1381 (Fed. Cir. 2000). According to the Federal Circuit:

Infringement under the doctrine of equivalents may be found when the accused device contains an “insubstantial” change from the claimed invention. Whether equivalency exists may be determined based on the “insubstantial differences” test or based on the “triple identity” test, namely, whether the element of the accused device “performs substantially the same function in substantially the same way to obtain the same result.” The essential inquiry is whether “the accused product or process contain elements identical or equivalent to each claimed element of the patented invention[.]”

TIP Sys., LLC v. Phillips & Brooks/Gladwin, Inc., 529 F.3d 1364, 1376-77 (Fed. Cir. 2008) (citations omitted).

2. Indirect Infringement

a. Induced Infringement

Section 271(b) of the Patent Act prohibits inducement: “[w]hoever actively induces infringement of a patent shall be liable as an infringer.” 35 U.S.C. § 271(b). *See DSU Med. Corp. v. JMS Co.*, 471 F.3d 1293, 1305 (Fed. Cir. 2006) (*en banc*) (“To establish liability under section 271(b), a patent holder must prove that once the defendants knew of the patent, they actively and knowingly aided and abetted another’s direct infringement.”) (citations omitted).

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“The mere knowledge of possible infringement by others does not amount to inducement; specific intent and action to induce infringement must be proven.” *Id.* (citations omitted).

b. Contributory Infringement

Section 271(c) of the Patent Act prohibits contributory infringement. *See* 35 U.S.C. § 271(c). “Under 35 U.S.C. § 271(c), a party who sells a component with knowledge that the component is especially designed for use in a patented invention, and is not a staple article of commerce suitable for substantial noninfringing use, is liable as a contributory infringer.” *Wordtech Sys., Inc. v. Integrated Networks Solutions, Inc.*, 609 F.3d 1308, 1316 (Fed. Cir. 2010).

B. Domestic Industry - Technical Prong

The technical prong of the domestic industry requirement is satisfied when the complainant in a patent-based section 337 investigation establishes that it is practicing or exploiting the patents at issue. *See* 19 U.S.C. §1337 (a)(2) and (3); *Certain Microsphere Adhesives, Process for Making Same and Prods. Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm’n Op. at 8 (U.S.I.T.C. Jan. 16, 1996). “In order to satisfy the technical prong of the domestic industry requirement, it is sufficient to show that the domestic industry practices any claim of that patent, not necessarily an asserted claim of that patent.” *Certain Ammonium Octamolybdate Isomers*, Inv. No. 337-TA-477, Comm’n Op. at 55 (U.S.I.T.C. Aug. 28, 2003).

The test for claim coverage for the purposes of the technical prong of the domestic industry requirement is the same as that for infringement. *See Certain Doxorubicin and Preparations Containing Same*, Inv. No. 337-TA-300, Initial Determination at 109, (U.S.I.T.C. May 21, 1990), *aff’d*, Views of the Commission at 22 (U.S.I.T.C. Oct. 31, 1990); *Alloc, Inc. v. Int’l Trade Comm’n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). “First, the claims of the patent are construed. Second, the complainant’s article or process is examined to determine whether it falls

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within the scope of the claims.” Inv. No. 337-TA-300, Initial Determination at 109. To prevail, the patentee must establish by a preponderance of the evidence that the domestic product practices one or more claims of the patent. The technical prong of the domestic industry can be satisfied either literally or under the doctrine of equivalents. *Certain Dynamic Sequential Gradient Devices and Component Parts Thereof*, Inv. No. 337-TA-335, Initial Determination at 44, Pub. No. 2575 (U.S.I.T.C. May 15, 1992).

III. JURISDICTION AND IMPORTATION

In order to have the power to decide a case, a court or agency must have both subject matter jurisdiction and jurisdiction over either the parties or the property involved. 19 U.S.C. § 1337; *Certain Steel Rod Treating Apparatus and Components Thereof*, Inv. No. 337-TA-97, Commission Memorandum Opinion, 215 U.S.P.Q. 229, 231 (U.S.I.T.C. 1981). Bosch does not dispute the Commission has subject matter jurisdiction over this investigation as well as personal jurisdiction over Bosch.

A. Importation and In Rem Jurisdiction

Respondents have stipulated to importations of accused table saws and components thereof. *See* Joint Stipulation Regarding Importation and Inventory (EDIS Doc ID 573704). Accordingly, the Commission has *in rem* jurisdiction over the Accused Products. *See Sealed Air Corp. v. United States Int’l Trade Comm’n*, 645 F.2d 976, 985 (C.C.P.A. 1981).

B. Subject Matter Jurisdiction

Section 337 confers subject matter jurisdiction on the International Trade Commission to investigate, and if appropriate, to provide a remedy for, unfair acts and unfair methods of competition in the importation, the sale for importation, or the sale after importation of articles into the United States. *See* 19 U.S.C. §§ 1337(a)(1)(B) and (a)(2).

SawStop alleges a violation of Section 337 in the importation and sale of table saws

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incorporating active injury mitigation technology and components thereof. SawStop alleges the accused table saws directly infringe the asserted patents and certain components of the accused table saws indirectly infringe the asserted patents. SawStop has alleged sufficient facts that, if proven, would demonstrate that Bosch imports articles that indirectly infringe SawStop's patents. *See Certain Elec. Devices with Image Processing Sys., Components Thereof, & Assoc. Software*, Inv. No. 337-TA-724, Comm'n Op., 2012 WL 3246515, *7 (U.S.I.T.C. Dec. 21, 2011) (citing *Amgen, Inc. v. ITC*, 902 F.2d 1532, 1536 (Fed. Cir. 1990)). *See also Suprema, Inc. v. International Trade Comm'n*, 796 F.3d 1338, 1352-53 (Fed. Cir. 2015) ("[T]he Commission's interpretation that the phrase 'articles that infringe' covers goods that were used by an importer to directly infringe post-importation as a result of the seller's inducement is reasonable.").

Accordingly, I find the Commission has subject matter jurisdiction over this Investigation under Section 337 of the Tariff Act of 1930. *Amgen, Inc. v. U.S. Int'l Trade Comm'n*, 902 F.2d 1532, 1536 (Fed. Cir. 1990).

C. Personal Jurisdiction

Bosch has fully participated in this Investigation by, among other things, responding to the complaint and fully participating in discovery, the claim construction process, and filing and responding to motions for summary determination. Bosch has participated in the evidentiary hearing, filed pre-hearing briefs, and are expected to file post-hearing briefs. Accordingly, I find Bosch has submitted to the jurisdiction of the Commission. *Certain Lithium Metal Oxide Cathode Mats., et al.*, Inv. No. 337-TA-951, Initial Determination at 10-11 (Feb. 29, 2016); *Certain Miniature Hacksaws*, Inv. No. 337-TA-237, Pub. No. 1948, Initial Determination at 4, 1986 WL 379287 (U.S.I.T.C. Oct. 15, 1986) (unreviewed by Commission in relevant part).

IV. DOMESTIC INDUSTRY - ECONOMIC PRONG

On March 22, 2016, I issued an initial determination granting SawStop's motion for

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summary determination that they have satisfied the economic prong of the domestic industry requirement. *See* Order No. 10. The ALJ found “that SawStop has conclusively and objectively established, with regard to the production of its various Domestic Industry Table Saws (contended to practice the Asserted Patents) that it: (1) made a significant investment in plant and equipment; (2) used significant employment of labor or capital within the United States; and (3) invested substantially to exploit the Asserted Patents through expenditures on engineering, research and development.” *Id.* at 18-19. On April 21, 2016, the Commission determined not to review Order No. 10. EDIS Doc. ID No. 579254.

V. U.S. PATENT NO. 7,225,712**A. Level of Ordinary Skill in the Art**

In Order No. 7 I found a person of ordinary skill in the art with respect to the ‘712 patent at the time of the invention would have had either an undergraduate degree in mechanical engineering and substantial coursework in electrical engineering, or an undergraduate degree in electrical engineering and substantial coursework in mechanical engineering, plus three to five years of professional experience in mechatronics and familiarity and experience with woodworking machines, including a basic understanding of how the machines operate. *See* Order No. 7 at 5.

B. Claims-at-Issue

The following claims of the ‘712 patent are at-issue in this investigation.

8. A woodworking machine comprising:

a working portion adapted to work when moving;

a detection system adapted to detect a dangerous condition between a person and the working portion by imparting an electric signal to the working portion and monitoring the electric signal for at least one change indicative of the dangerous condition;

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a reaction system associated with the detection system to cause a predetermined action to take place relative to the working portion upon detection of the dangerous condition; and

a motion detection system adapted to detect motion of the working portion and to disable the reaction system when the working portion is not moving.

9. The woodworking machine of claim 8, where the working portion is a spinning blade and where the motion detection system detects whether the blade is spinning.

11. The woodworking machine of claim 8, where the motion detection system includes a sensor.

12. The woodworking machine of claim 11, where the sensor is a Hall effect sensor.

15. The woodworking machine of claim 11, where the sensor is an electrical sensor.

18. A woodworking machine comprising:

a cutting tool;

a motor to spin the cutting tool;

a detection system adapted to detect a dangerous condition between a person and the cutting tool by imparting an electric signal to the cutting tool and monitoring the electric signal for at least one change indicative of the dangerous condition;

a reaction system associated with the detection system to cause a predetermined action to take place relative to the working portion upon detection of the dangerous condition; and

a control system adapted to monitor the detection system and control actuation of the reaction system, where the control system is adapted to trigger the reaction system if the dangerous condition is detected when the motor is spinning the cutting tool or during coast-down of the

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cutting tool after the motor is turned off and to deactivate the reaction system after coast-down.

19. The woodworking machine of claim 18, where the reaction system is a brake system, and where the predetermined action is to engage and stop the culling tool.

20. The woodworking machine of claim 18, where the control system is adapted to re-activate the reaction system when the motor starts spinning the cutting tool after deactivation of the reaction system.

C. Claim Construction

As set forth in Order No. 7, the parties agreed to three claim constructions relevant to the claims of the '712 patent:

Claim Term	Agreed Construction
"a working portion adapted to work when moving" ('712 patent, claim 8)	"mechanical portion of the woodworking machine adapted to perform operations such as cutting"
"deactivate the reaction system after coast down" ('712 patent, claim 18)	"disable the reaction system after coast down"
"re-activate the reaction system" ('712 patent, claim 20)	"re-enable the reaction system"

In addition, in Order No. 7 I construed the terms "detection system" (claims 8 and 18), "motion detection system" (claim 8), "control system" (claim 18), and "predetermined action" (claim 8) to have their plain and ordinary meaning as understood by one of ordinary skill in the art in view of the specification and prosecution history. *Id.* at 7-10. In Order No. 11 I construed the term "not moving" (claim 8) to mean "stopped" and the term "after coast-down" (claim 18) to mean "the time after coast-down when the cutting tool is stopped." Order No. 11 at 45.

Further, in Order No. 11 I found the term "reaction system" (claims 8, 18 and 20) is properly construed under 35 U.S.C. § 112, ¶ 6. Order No. 11 at 8-9. The recited functions of the "reaction system" are "to cause a predetermined action to take place relative to the working

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portion upon detection of the dangerous condition” (claim 8), and “to cause a predetermined action to take place relative to the cutting tool upon detection of the dangerous condition” (claim 18). (See CIB at 34-35; RRB at 2.) JX-016.17-18.²

The only remaining claim-construction issue left for this initial determination is the identification of corresponding structure. A structure is “corresponding” only if “the specification or the prosecution history clearly links or associates that structure to the function recited in the claim.” *Noah Sys. Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311 (Fed. Cir. 2012) (internal quotations omitted); *Budde v. Harley-Davidson, Inc.*, 250 F.3d 1369, 1377 (Fed. Cir. 2001) (“As a quid pro quo for the convenience of employing § 112, paragraph 6, [the patentee] has a duty to clearly link or associate the structure to the claimed function.”).

SawStop argues there are a number of structures described in the specification of the ‘712 patent that are clearly linked to the reaction system’s claimed function of causing a predetermined action to take place relative to the working portion/cutting tool upon detection of the dangerous condition. (See CIB at 42-43.) Of these structures, SawStop relies only on the one it refers to as *Retraction Embodiment #3* to prove infringement and only on the one it refers to as *Braking Embodiment #1* to prove technical prong. Thus, I will confine my analysis to those structures.

1. **Retraction Embodiment #3**

The Parties’ Positions

SawStop describes Retraction Embodiment #3 as “direct retraction through contact with the arbor block” and argues that this structure consists of the combination of an arbor block, compound linkage, fusible member, and spring, and equivalents thereof. (*Id.* at 42-43 (citing

² Claim 18 of the ‘712 patent is subject to a Certificate of Correction that replaces the term “working portion” with the term “cutting tool.” CX-077.

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Provisional Application 60/225,089 at 14:17-16:10, Figs. 10-12).³

Bosch takes issue with the structure SawStop refers to as Retraction Embodiment #3 for two reasons. First, Bosch argues that the embodiment includes more structure than what SawStop proposes to include in the claim construction. (RRB at 4.) Second, Bosch argues that the described structure as proposed by SawStop is not clearly linked as a “reaction system.” (*Id.*)

With regard to the first argument, Bosch contends that Retraction Embodiment #3 must also include a brake. Bosch asserts that SawStop’s argument that “no brake is illustrated or discussed in connection with the embodiment” is not only unsupported by any testimony, but literally false. (*Id.*) Bosch argues that the description of Figures 10-12 in the provisional application specifically states that the structure identified in the Figures is a direct displacement system intended to be used in connection with the earlier-described braking embodiments. (*Id.* at 4-5.)

With regard to the second argument, Bosch contends that although SawStop argues that the structure of Figures 10–12 can be separated from the brake described in “the systems described above” because the patent documents state the structure in Figures 10–12 could be used as a “sole means of retraction,” nothing in this section of the disclosure clearly links this “sole means of retraction” structure to the “reaction system” recited in the claims. (*Id.* at 5.) Nor, Bosch argues, did SawStop present any testimony that one of ordinary skill in the art would find such a link to be clearly described. (*Id.*) Bosch argues that the “test is whether one of skill in the art would find the proposed structure clearly linked to the claim element, and here, the chain of propositions is too long, too uncertain, and too unsupported by record evidence to prove

³ The ‘089 Provisional Application is incorporated by reference into the ‘712 patent at 4:21-26.

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one of skill in the art would identify Figures 10–12, by themselves and not including a brake, to be linked to the ‘reaction system’ claim element.” (*Id.* at 6.)

Discussion

Bosch raises two arguments with respect to *Retraction Embodiment #3*. First, Bosch argues that the embodiment must include a brake. The only portion of the specification Bosch relies on to support this argument is a statement that “[i]n any of the systems described above, a spring or other force can be used to push the blade away from the point of contact with the user.” However, reading the specification as a whole, it is clear that the phrase “systems described above” refers to any of the woodworking machine safety systems described prior to Figures 10–12. CX-083 at 14:17–24.

Contrary to Bosch’s argument, Figures 10–12 describe an alternative embodiment that may be used in connection with a brake-based reaction system, or as a standalone “direct retraction” system where a “spring or other force” is used as the “sole means of retraction.” CX-083 at 16:6–10; *see also id.* at 9:24–25 (“A retraction system may be used *in addition to or instead of other safety mechanisms.*”) (emphasis added). Specifically, the embodiment depicted in Figures 10–12 show the arbor as supported by arbor block 381, which is pivotally mounted to pin 383, allowing the arbor block 381, arbor 382, and blade to pivot up and down relative to the table. CX-083 at 14:17–16:10, Figs. 10–12. A spring 389 is held in compression against the arbor block 381. *Id.* at 14:25–15:9. A compound linkage, which provides a mechanical advantage such that the arbor block and top portion of the segment gear can be held with as thin a fusible member possible, includes two mechanical restraining arms 390 and 391 that are linked to each other and to the arbor block 381. *Id.* at 14:25–15:9, 15:20–23. In normal operation, the application teaches that a fusible member 392 restrains the arms 390 and 391 against the force of

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spring 389. *Id.* However, the application teaches that in response to a dangerous condition, a current is passed through the fusible member 392, causing it to fail. *Id.* As the spring 389 is no longer restrained, it forces the arms 390 and 391 to pivot, allowing the arbor block 381, arbor 382, and saw blade to pivot and retract downward about the pin 383. *Id.* Based on these disclosures, SawStop's expert Dr. Wolfe testified that a person of ordinary skill in the art would understand that a brake is not necessary to cause retraction of the arbor block and saw blade in *Retraction Embodiment #3*. Tr. at 535:12-538:16.

Accordingly, for at least the reasons above, I find Retraction Embodiment #3 need not include a brake. Furthermore, I find that the structural elements involved in retraction are the arbor block, the spring that forces the arbor block to retract, and the fusible member and compound linkage, which releases the stored energy of the spring when the fuse wire is burned. CX-083 at 14:25-15:9, 15:20-23, Figs. 10-12.

Second, Bosch argues that the patent specification does not “clearly link” Retraction Embodiment #3 to the “reaction system” recited in the claims. This argument, however, is based on an incorrect legal standard. Whether the structure identified by SawStop is corresponding structure does not turn on whether the structure is linked to the phrase “reaction system,” but whether it is linked to the claimed function associated with the claimed “reaction system.”

Micro Chem., Inc. v. Great Plains Chem. Co., 194 F.3d 1250, 1257-58 (Fed. Cir. 1999) (“Application of § 112, ¶ 6 requires identification of the structure in the specification which performs the recited function.”). The determination of what structure is necessary to perform the claimed function is “from the perspective of a person of ordinary skill in the art.” *Card. Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 1113 (Fed. Cir. 2002).

The parties agree that the claimed function associated with the “reaction system”

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limitation is “to cause a predetermined action to take place relative to the working portion upon detection of the dangerous condition” (claim 8) and “to cause a predetermined action to take place relative to the cutting tool upon detection of the dangerous condition” (claim 18). CIB at 34-35; RRB at 2. Based on the ‘712 patent specification, I find a person skilled in the art would understand that the disclosed safety system can perform different “predetermined actions,” including “retraction of the cutting tool,” and that these actions can be performed either alone or in combination. *See* JX-016 at 4:4-26 (“For example, reaction subsystem 24 may be configured to do one or more of the following: stop the movement of cutting tool 14, disconnect motor assembly 16 from power source 20, place a barrier between the cutting tool and the user, or retract the cutting tool from its operating position, etc.”); *see also* JX-017 at 4:17-38. The specification makes clear that these “predetermined actions” take place upon detection of a dangerous condition. The specification goes on to explain that “Retraction of the cutting tool from its operating position is described in more detail in U.S. Provisional Patent Application Ser. No. 60/225,089.” *Id.* The ‘089 provisional application, in turn, identifies the embodiment of Figures 10-12 as an exemplary structure for performing the “predetermined action” of “direct retraction.” CX-83 at 14:17-16:10. Reading these passages together, I find a person skilled in the art would understand that the patent specifications clearly link Retraction Embodiment #3 to the function of retraction, which is a predetermined action that takes place relative to the cutting tool/working portion upon detection of a dangerous condition.” Tr. at 535:12-537:19.

Accordingly, for the reasons above, I find Reaction Embodiment #3 to be structure corresponding to the claimed reaction system’s claimed function of causing a predetermined action to take place relative to the cutting tool/working portion upon detection of a dangerous condition.

PUBLIC VERSION**2. Braking Embodiment #1**

SawStop argues that Braking Embodiment #1 consists of “the combination of a brake pawl, spring, and fuse wire, and equivalents thereof.” (CIB at 35 (citing the ‘712 patent at 5:45-6:36).) SawStop also argues this structure is clearly linked to the claimed function of causing a predetermined action to take place relative to the cutting tool/working portion upon detection of a dangerous condition. (CIB at 35-37.) Bosch agrees with SawStop, stating in its responsive brief that Braking Embodiment #1 (*i.e.*, the combination of brake pawl, spring, and fuse wire) is a structure described in the specification of the ‘712 patent and clearly linked to the claimed “reaction system” elements. (RRB at 3.)

Accordingly, there being no dispute, I find Braking Embodiment #1 to be structure corresponding to the claimed reaction system’s claimed function of causing a predetermined action to take place relative to the cutting tool/working portion upon detection of a dangerous condition.

D. Infringement

SawStop alleges the Accused Products infringe claims 8, 9, 11, 15, 18 and 20 of the ‘712 patent.

1. Claim 8

At the hearing, SawStop adduced a significant amount of testimony in support of its argument that the Accused Products infringe independent claim 8 of the ‘712 patent. The uncontested evidence shows the Accused Products are woodworking machines including a working portion adapted to work when moving in the form of a saw blade mounted to an arbor that is driven by a motor. Tr. at 339:18-340:21, 454:15-24; RPX-2; CX-181C; CX-232C. The uncontested evidence also shows the Accused Products include “a detection system adapted to detect a dangerous condition between a person and the working portion by imparting an electric

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signal to the working portion and monitoring the electric signal for at least one change indicative of the dangerous condition.” *See generally* Tr. at 454:25-455:7, 340:22-341:6, 346:12-348:11, 401:24-403:5. Specifically, the evidence shows the detection system is implemented through a microprocessor [

]

Tr. at 340:22-341:6; 346:12-348:11; CX-182C.9; CX-183C.3. [

] Tr. at

347:5-348:11; CX-182C.9; CX-183C.3. [

] Tr. 347:5-348:11; CX-182C.9. [

] Tr. at 347:5-348:11;

CX-182C.9; CX-183C.3. Software executing [] implements an algorithm that processes the measurements to determine whether they are indicative of a dangerous condition.

Tr. at 347:5-350:24; CX-182C.14. [

]

Tr. at 347:5-350:24; CX-182C.14. [

] Tr. at 347:5-350:24; CX-182C.14; CX-

204C.6. At the hearing, SawStop’s expert, Dr. Wolfe, convincingly testified that these elements meet the requirements of the “detection system” limitation recited in claim 8 of the ‘712 patent because they detect a dangerous condition between a person and the saw blade by imparting an electric signal to the saw blade and monitoring the electric signal for at least one change indicative of a dangerous condition resulting from human contact with the saw blade. Tr. at

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454:25-455:7, 401:24-403:5.

Bosch argues the Accused Products do not infringe claim 8 for two reasons: (1) the Accused Products do not include the claimed “reaction system;” and (2) the Accused Products do not include a “motion detection system adapted . . . to disable the reaction system when the working portion is not moving.”

a. “reaction system”

The Parties’ Positions

SawStop

SawStop argues the facts presented during the evidentiary hearing demonstrate the Accused Products perform the claimed function associated with the “reaction system” limitation of claim 8, and include the equivalent of Retraction Embodiment #3. (CIB at 41.) SawStop contends the recited function for the “reaction system” in claim 8 is “to cause a predetermined action to take place relative to the working portion upon detection of the dangerous condition” and that Bosch does not dispute that the Accused Products perform this function. (*Id.*) Specifically, SawStop argues the Accused Products perform the predetermined action of retracting the saw blade in response to the contact detection system determining that a dangerous condition exists between a user and the saw blade. (*Id.*)

SawStop argues that Retraction Embodiment #3 includes the combination of an arbor block, a spring, a compound linkage, and a fuse wire and that these elements are depicted in Figures 11 and 12 of the ‘089 application. (CIB at 42.) SawStop contends the relevant structure in the Accused Products is the combination of a swing arm, a pyrotechnic cartridge that includes a piston and explosive material, and a bridge wire. (*Id.* at 43.) SawStop argues that the evidence presented at the hearing demonstrates that the differences between the Accused Products and Retraction Embodiment #3 are insubstantial for the purpose of performing the claimed function.

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(*Id.* at 44.)

First, SawStop argues the evidence shows the retraction structure in the Accused Products performs the claimed function in substantially the same way to achieve substantially the same result as Retraction Embodiment #3. (*Id.* at 44-45.) SawStop contends the “function” and “result” prongs of this test are not in dispute. (*Id.* at 45.) SawStop argues the Accused Products have “functional identity” with Retraction Embodiment #3. (*Id.*) SawStop also argues that in performing the claimed function, the retraction structure in the Accused Products achieves the same result as *Retraction Embodiment #3*. (*Id.*) According to SawStop, the result achieved by *Retraction Embodiment #3* is retraction of the saw blade down and away from the user and the result achieved by the Accused Products is also to retract the saw blade down and away from the user. (*Id.*)

SawStop argues with respect to the “way” prong that Dr. Wolfe provided detailed testimony during the evidentiary hearing establishing that the retraction structure in the Accused Products performs the claimed function in substantially the same way as Retraction Embodiment #3. (*Id.*) According to SawStop, Dr. Wolfe explained that both the retraction structure in the Accused Products and Retraction Embodiment #3 perform the predetermined action of retracting the saw blade by discharging current through a wire to quickly release an expansive force that drives a piece of metal—*i.e.*, the spring or piston—into the pivoting arm in order to retract it down and away from the user. (*Id.* at 46.) Specifically, SawStop argues the way in which *Retraction Embodiment #3* performs the claimed function is by discharging a current through the fuse wire to quickly release stored energy in the compressed spring, which causes the spring to expand and push the pivoting arbor block down and away from the user. (*Id.* at 46-47.) SawStop argues the retraction structure in the Accused Products performs the claimed function

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in substantially the same way, by discharging a current through the bridge wire to quickly release stored energy in the pyrotechnic material, which causes the piston to move forward and push the pivoting swing arm down and away from the user. (*Id.*)

SawStop contends Dr. Wolfe identified only two differences between Retraction Embodiment #3 and the retraction structure in the Accused Products: (1) Retraction Embodiment #3 uses a compound linkage to provide a mechanical advantage to the action of the fuse wire; and (2) Retraction Embodiment #3 uses stored energy in a compressed spring to retract the arbor block and saw blade, while the latter uses stored energy in a pyrotechnic material. With regard to the first difference, SawStop argues that the mechanical advantage allows the embodiment to utilize a thinner fuse wire that burns more quickly and therefore releases the stored energy of the spring more quickly. (*Id.* at 47.) SawStop asserts that Dr. Wolfe accounted for this difference and explained that it did not change his opinion that the two structures are equivalent because they still used the same theory of operation—*i.e.*, discharging current through the wire to quickly release stored energy and retract a pivoting arm that supports a saw blade. (*Id.*) SawStop notes that Dr. Wolfe correctly analyzed the structures as a whole, rather than treating the compound linkage in isolation. (*Id.*)

With regard to the second difference, SawStop contends Dr. Wolfe accounted for this difference as well, and explained that it did not change his opinion that the two structures are equivalent for the purpose of performing the claimed function. (*Id.* at 48.) SawStop again notes that Dr. Wolfe considered the claimed structures as a whole, and that Dr. Wolfe explained a person or ordinary skill in the art would have considered the compressed spring-based structure in Retraction Embodiment #3 and the pyrotechnic-based structure in the Accused Products to be two “alternatives that a designer would look at as to how to create the expansive force on the

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swing arm.” (*Id.*) SawStop argues that this is the exact standard for demonstrating that two structures are known to be interchangeable, and therefore equivalent. (*Id.*)

SawStop argues that substantial documentary evidence presented during the hearing corroborates Dr. Wolfe’s testimony. (*Id.*) Specifically, SawStop argues that in 2003 a joint venture between Bosch and several other power-tool manufacturers hired a design firm called D2M to assist in the development of active injury mitigation technology. (*Id.*) SawStop argues that the team was specifically tasked with evaluating different actuators for retracting a saw blade in response to detection of a dangerous condition. SawStop contends that as a result of its evaluation, the team concluded that there were two “Viable Technologies”: a “Spring Mechanism” and a “Pyrotechnic Mechanism.” (*Id.*) SawStop argues that this evidence demonstrates that shortly after the time of the invention, a team of persons skilled in the art sat down to determine which technologies were suitable for retracting the saw blade and the team concluded that the spring mechanism and pyrotechnic mechanism were viable alternatives and could be implemented with similar constructions and housings. (*Id.* at 49.)

SawStop argues that additional evidence supporting Dr. Wolfe’s testimony can be found in U.S. Patent No. 7,373,863, which is assigned to Black & Decker Inc. and claims priority to provisional applications filed in 2001—one year after the provisional applications that led to the Asserted Patent. (*Id.* at 50.) SawStop argues that the patent discloses different table saw embodiments, including a miter saw that uses an actuator to retract the saw blade upward and away from the user in response to a dangerous condition. (*Id.*) SawStop argues that the specification of the patent explains that the actuator—referred to as a “deployment mechanism”—“may include any sufficient mechanism capable of displacing arm 742 about pivot 752 such as, but not limited to, an explosive device, a mechanical spring, compressed gas, or the

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like.” (*Id.*) According to SawStop the Black & Decker patent shows that persons of ordinary skill recognized explosive-based mechanisms to be interchangeable with spring-based mechanisms for the purpose of retracting a saw blade. (*Id.*)

SawStop further argues that Dr. Gass himself considered explosive-based and spring-based mechanisms to be interchangeable for the purpose of braking a saw blade. (*Id.* at 51.) Specifically, SawStop argues that Dr. Gass filed U.S. Provisional Application No. 60/225,056, which describes a braking embodiment similar to the cartridge in SawStop’s current products, where a spring is used to urge a brake pawl into a spinning saw blade. (*Id.*) SawStop contends that the application discloses an alternative embodiment where an explosive squib is used as an alternative to the spring. (*Id.*) According to SawStop, Dr. Wolfe explained that this evidence, while directed to a brake pawl embodiment, demonstrates that Dr. Gass, as a person of ordinary skill in the art, understood that springs and explosives could be used interchangeably to accelerate a hinged arm such as the swing arm assembly in the Accused Products. (*Id.*)

Bosch

Bosch argues that the evidence presented at the hearing was not sufficient to prove that the pyrotechnic retraction system in the accused products is structurally equivalent to the spring/linkage/restraining wire structure of Figures 10–12 in the ’089 provisional application. (RRB at 8.) First, Bosch argues that SawStop’s expert, Dr. Wolfe, is not credible on the structural-equivalents issue, because as his opinion testimony displayed, he is an expert in mechatronics generally, but not mechanical engineering in particular. (*Id.*) Specifically, Bosch contends that Dr. Wolfe did not understand the complexity of the mechanisms at-issue as he testified that the mechanical engineering issues in this case are “simple.” (*Id.* at 10.) Bosch argues that Dr. Wolfe’s training and experience is in patent-infringement analysis and giving

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testimony, electrical engineering, and mechatronics—selecting actuators, for example—but not in the mechanical engineering necessary to design a retraction system that will work quickly and reliably. (*Id.*) Thus, Bosch argues Dr. Wolfe’s testimony on the narrow issue of structural equivalence should not be credited. (*Id.*)

Second, Bosch argues that SawStop failed to prove the structure of the REAXX Saw is structurally equivalent to Retraction Embodiment #3. (*Id.*) Bosch argues that either under the “insubstantial differences test” or the “modified function-way-result test” the evidence shows that the two structures are not equivalent. (*Id.*) With regard to the insubstantial differences test, Bosch argues that the evidence shows that the REAXX saw and Retraction Embodiment #3 are substantially different. Bosch argues that the structural differences are plain obvious. (*Id.* at 11.) Bosch contends the accused products use a pyrotechnic-powered piston to push the blade down and that unless the pyrotechnic is ignited, nothing happens and the system is stable. (*Id.*) By comparison, Bosch argues the spring structure SawStop identifies is unstable in that the spring is actively pressing the arm down at all times, and is held back by the restraining wire. (*Id.*) Bosch argues that even SawStop and Dr. Gass acknowledge in their marketing materials that the differences between a pyrotechnic system and a spring-based system are substantial. (*Id.*) Further, Bosch argues Dr. Wolfe himself acknowledged that the differences between the two systems are so substantial that he had a clear preference for the spring over the explosive. (*Id.* at 13.)

With regard to the “modified function, way, result test,” Bosch argues SawStop did not prove structural equivalence under this test either. (*Id.* at 14.) Bosch argues that the evidence at the hearing demonstrated: (1) the two actuators use different types of energy; (2) a continuous force is exerted in Retraction Embodiment #3 (which requires a compound linkage) as compared

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to the REAXX saw where the system exerts no force prior to actuation; and (3) the systems trigger the actuation differently. (*Id.*) In support, Bosch relies on the testimony of Dr. Dubowsky. (*Id.* at 14-15.) Bosch also argues Mr. Laliberte's testimony illustrates the differences between the reaction system in the REAXX system and the way Retraction Embodiment #3 functions. (*Id.* at 15.)

Bosch argues that in addition to the differences in the way the two structures perform the function, the evidence at the hearing showed that the two structures produce different results when performing the function. (*Id.* at 16.) SawStop argues the results achieved by the REAXX saw are better than those that could hypothetically be achieved by the structure of Retraction Embodiment #3 as described by Dr. Wolfe—the retraction is faster. (*Id.*) Bosch argues that Dr. Dubowsky testified that the pyrotechnic actuator in the REAXX saw is much more powerful (and less cumbersome) than the spring from Retraction Embodiment #3. (*Id.*) Bosch contends Mr. Laliberte testified that test data showed that the maximum force the pyrotechnic piston could exert on the swing arm is [] (*Id.* at 17.) Bosch argues that this is [] that Dr. Wolfe identified. (*Id.*) Bosch also argues with respect to the timing of the retraction that Dr. Wolfe testified that, by his calculations, the REAXX saw retracts the blade in approximately []

[] (*Id.*) By contrast, Bosch argues that Dr. Wolfe testified that using the [] in the REAXX saw, the blade would retract in approximately [] milliseconds. (*Id.*) Thus, Bosch argues, the undisputed evidence at the hearing showed that the pyrotechnic structure in the REAXX saw is more powerful and thus retracts the blade faster—*i.e.*, it produces better results. (*Id.*) Bosch further argues that another difference in result is that, in the REAXX saw, the pyrotechnic

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cartridge is easily replaceable. (*Id.*) Bosch contends it is unclear how the spring in Retraction Embodiment #3 would be reset. (*Id.*) Bosch argues that the evidence shows resetting the spring mechanism would be extremely difficult. (*Id.*) Bosch argues that comparing the spring-powered structure of Retraction Embodiment #3 to the pyrotechnic-powered structure Bosch REAXX is like comparing a loaded crossbow to a loaded rifle. Both the bolt and the bullet could be used to perform a similar ultimate function, but the crossbow and the rifle are not structurally equivalent. (*Id.* at 18.)

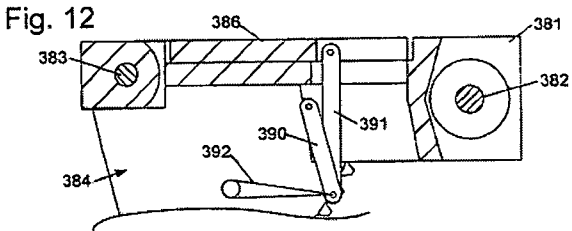
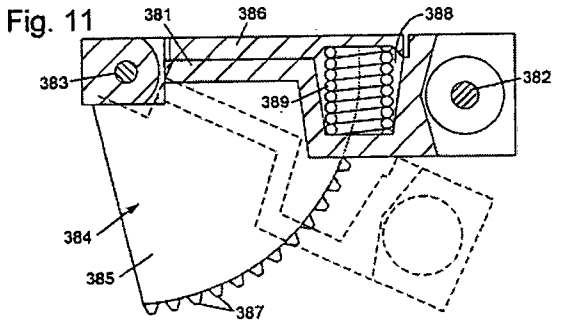
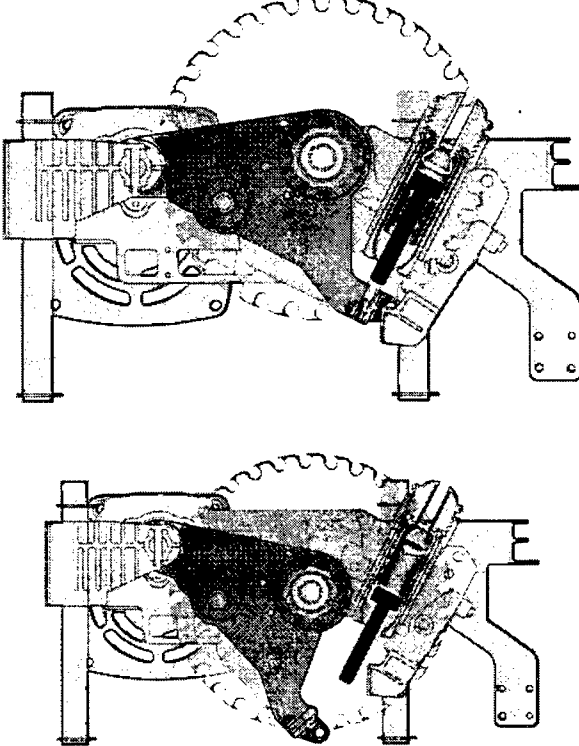
Discussion

In Order No. 11 I held the “reaction system” limitation in claim 8 of the ‘712 patent is properly construed under 35 U.S.C. § 112, ¶ 6. Order No. 11 at 5-9. The claimed function of the claimed reaction system is “to cause a predetermined action to take place relative to the working portion upon detection of the dangerous condition.” *See* § V.C., *supra*. As discussed above, I have found Retraction Embodiment #3, which consists of the combination of an arbor block, compound linkage, fusible member, and spring, to be structure corresponding to that claimed function.

SawStop does not argue the Accused Products literally include Retraction Embodiment #3. Rather, SawStop argues that the Accused Products include structure that is equivalent to Retraction Embodiment #3. Specifically, SawStop contends the combination of the swing arm, pyrotechnic cartridge that includes a piston and explosive material, and bridge wire in the Accused Products is equivalent to Retraction Embodiment #3. That is, SawStop contends the combination of the swing arm, pyrotechnic cartridge that includes a piston and explosive material, and bridge wire in the Accused Products is equivalent to the combination of an arbor

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block, compound linkage, fusible member, and spring disclosed in the '712 patent. Below is a table comparing Retraction Embodiment #3 with the accused structure in the Accused Products.

The '712 Patent	The Accused Products
combination of an arbor block, compound linkage, fusible member, and spring	combination of swing arm, pyrotechnic cartridge that includes a piston and explosive material, and bridge wire
<p>Fig. 12</p>  <p>Fig. 11</p>  <p>CX-083.0026</p>	 <p>CDX-5; see also CX-181C.11.</p>

As illustrated above in the figures of Retraction Embodiment #3, the arbor block 381 supports the arbor 382, which in turn supports the saw blade (not shown). CX-083.0015-16. The arbor block is pivotally mounted to pin 383, allowing it to perform the predetermined action of retracting the saw blade downward and away from the user. *Id.* The spring 389 is positioned between the arbor block and the upper portion 386 of a segment gear that forms the saw's height-adjustment mechanism. *Id.* In normal operation, the spring is held in compression by the fuse

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wire 392 and compound linkage 390 and 391. *Id.* When the detection system determines that a dangerous condition exists between a user and the saw blade, a charge is passed into the fuse wire, causing it to break. *Id.* The spring releases and pushes against the arbor block, causing it to pivot about the pin and retract the saw blade down and away from the user. *Id.*; Tr. at 406:2-407:5; RDX-1.

As illustrated above in the figures of the Accused Products, the swing arm (shown in blue) supports an arbor, which in turn supports the saw blade. CDX-5; *see also* CX-181C.0011. The arbor block is pivotally mounted to a pin, allowing it to retract the saw blade downward and away from the user. *Id.* A pyrotechnic cartridge is positioned next to the swing arm and includes a piston (shown in red) abutting the swing arm. *Id.* A pyrotechnic material is positioned above the piston, and a bridge wire is inserted into a plug at the top of the cartridge. *Id.*; CX-224C. When the detection system in the Accused Products determines that a dangerous condition exists between a user and the saw blade, a charge is passed into the bridge wire, causing it to heat up and ignite the material inside the cartridge. Tr. 24:1-5, 24:15-20, 350:16-354:1. The heat causes the pyrotechnic material to release compressed gas, which rapidly expands to push the piston downward and into the swing arm. *Id.* at 354:2-11. The swing arm pivots about the pin and retracts the saw blade down and away from the user. *Id.*; CX-181C.0011 and 0016; CDX-5; *see also* Tr. 739:5-740:14, CX-99C.0012.

“Literal infringement of a § 112, ¶ 6 limitation requires that the relevant structure in the accused device perform the identical function recited in the claim and be identical or equivalent to the structure in the specification.” *Odetics, Inc. v. Storage Tech. Corp.*, 185 F.3d 1259, 1267 (Fed. Cir. 1999). As set forth above, the evidence shows the accused retraction structure in the Accused Products performs the claimed function of causing a predetermined action to take place

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relative to the cutting tool—*i.e.*, retraction of the saw blade. Tr. at 354:12-357:13, 419:18-420:8; CX-181C; CDX-5. Thus, I find the Accused Products have “functional identity” with Retraction Embodiment #3. *Id.*

Equivalence is a question of facts. Two structures are equivalent for purposes of infringement if they are “insubstantially different.” “[A] patentee may prove that a particular claim element is met under the doctrine of equivalents ... by showing that ‘the accused product performs substantially the same function in substantially the same way with substantially the same result’ as claimed in the patent.” *Energy Transp. Grp., Inc. v. William Demant Holding A/S*, 697 F.3d 1342, 1352 (Fed.Cir.2012) (quoting *Crown Packaging Tech., Inc. v. Rexam Bev. Can Co.*, 559 F.3d 1308, 1312 (Fed. Cir. 2009)); *see also Warner–Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 39–40 (1997). Because literal infringement under § 112, ¶ 6 requires functional identity—*i.e.*, the structure in the Accused Products must perform the identical claimed function—“[t]he content of the test for insubstantial differences under § 112, ¶ 6 thus reduces to ‘way’ and ‘result.’” *Odetics*, 185 F.3d at 1367 (“That is, the statutory equivalence analysis requires a determination of whether the ‘way’ the assertedly substitute structure performs the claimed function, and the ‘result’ of that performance, is substantially different from the ‘way’ the claimed function is performed by the ‘corresponding structure, acts, or materials described in the specification,’ or its ‘result.’”). “[A] structural equivalent under § 112 must have been available at the time of the issuance of the claim.” *Al-Site Corp. v. VSI Int’l, Inc.*, 174 F.3d 1308, 1320 (Fed. Cir. 1999) (citing *Chiuminatta*, 145 F.3d at 1310).

Bosch argues that the Accused Products do not perform the claimed function in substantially the same way to achieve substantially the same result as Retraction Embodiment #3. As discussed in more detail below, I find the Accused Products do not perform the claimed

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function in substantially the same way as Retraction Embodiment #3. However, I disagree with Bosch that the Accused Products and Retraction Embodiment #3 do not achieve substantially the same result.

Before addressing the parties' substantive arguments, I wish to first address Bosch's request that I discredit Dr. Wolfe's testimony on the issue of equivalents under §112, ¶ 6, because he lacks the requisite expertise in mechanical engineering. (RRB at 8.) This is the same argument Bosch raised in *voir dire* at the evidentiary hearing. Tr. at 329:14-17. I rejected that argument at the hearing and reject it again now. I found Dr. Wolfe to be a person of skill in the art and qualified him in the field of mechatronics. Tr. at 333:14-334:12. Mechatronics is a field that combines mechanical and electrical engineering, including the use of sensors and actuators with electronic controllers to perform mechanical tasks with electrical control. Tr. at 324:9-15. Bosch does not offer any reason why an expert with these qualifications is not capable of providing credible testimony on the mechanical engineering issues associated with the swing-arm assembly in the Accused Products. Nor does Bosch point to any specific testimony from Dr. Wolfe that is allegedly not credible. At the hearing Dr. Wolfe provided detailed testimony on the equivalency issue. I simply find no basis to discredit Dr. Wolfe's testimony in the wholesale manner in which Bosch requests.

Result

The result achieved by Retraction Embodiment #3 is retraction of the saw blade down under the work surface and away from the user. Tr. at 416:4-417:10, 419:20-420:3. The evidence shows the retraction structure in the Accused Products achieves the same result; it retracts the saw blade down under the work surface and away from the user. Tr. at 417:11-419:7, 420:4-420:8, 420:19-421:1.

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Bosch argues that the swing-arm assembly in the Accused Products achieves a different result than *Retraction Embodiment #3*, namely, a faster retraction time. But Bosch does not cite any evidence to show that a person skilled in the art would have considered the difference substantial. Dr. Wolfe explained that the difference would amount to [

] which would still retract the saw blade away from the user in a time sufficient to mitigate injury, even under the worst case conditions. Tr. at 434:10-18. Bosch does not rebut this testimony. Dr. Dubowsky's testimony on the issue was conclusory at best, *see* Tr. at 20:8-25, and as between Dr. Wolfe and Dr. Dubowsky, I find Dr. Wolfe's testimony on this point more salient and credible. Accordingly, in light of the evidence, I find the retraction structure in the Accused Products achieves substantially the same result as *Retraction Embodiment #3*.

Way

With respect to the "way" prong, SawStop's expert Dr. Wolfe provided detailed testimony during the evidentiary hearing that the retraction structure in the Accused Products performs the claimed function in substantially the same way as *Retraction Embodiment #3*. Tr. at 418:2-419:7, 420:9-18. Specifically, Dr. Wolfe testified:

Q. And can you explain to us why you believe this structure is equivalent to what's in retraction embodiment 3?

A. Yes. This structure mounts the blade on a swing arm, just like the retraction embodiment 3. That swing arm is mounted on a hinge that it can rotate around and is used to hold the blade in place during cutting. Just like in retraction embodiment 3.

When a dangerous condition is detected, this embodiment starts by receiving a current from the controller, indicating that it's time to react. That [is] the same as in retraction embodiment 3.

That causes – that current flows through a wire and heats it up, again very much like retraction embodiment 3.

Now, in response here, what happens when that wire heats up is the chemical in the pyro cartridge []

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[] That's similar to what happens in retraction embodiment 3, because what it's trying to accomplish is to push a piece of metal, in this case the piston, towards the swing arm using that expansive force.

And the swing arm then is in contact with the piston, it gets pushed down, just like in retraction embodiment 3, very quickly. And that pulls the blade down under the work surface, just like in retraction embodiment 3.

So when I look at that whole combination of things together, I find that to be similar enough and, I believe, substitutable for retraction embodiment 3. And I would find them to be equivalent.

Tr. at 418:2-419:7; *see also id.* at 420:9-18. According to Dr. Wolfe, the way in which *Retraction Embodiment #3* performs the claimed function is by discharging a current through the fuse wire to quickly release stored energy in the compressed spring, which causes the spring to expand and push the pivoting arbor block down and away from the user. Tr. at 418:2-419:7. According to Dr. Wolfe, the retraction structure in the Accused Products performs the claimed function in substantially the same way, by discharging a current through the bridge wire to quickly release stored energy in the pyrotechnic material, which causes the piston to move forward and push the pivoting swing arm down and away from the user. Tr. at 418:2-419:7.

I find Dr. Wolfe's testimony oversimplifies the way in which the Accused Products operate to retract the saw blade beneath the work surface and in doing so fails to appreciate the differences between the way *Retraction embodiment # 3* and the Accused Products perform the claimed function. Accordingly, as discussed in more detail below, I find the accused retraction structure in the Accused Products is not insubstantially different from *Retraction Embodiment #3*. Thus, I find the two structures are not equivalent. Because SawStop has failed to prove that the Accused Products include the claimed "reaction system," I find the Accused Products do not infringe claim 8 of the '712 patent.

Although downplayed by Dr. Wolfe, the evidence shows the way in which the Accused Products retract the saw blade beneath the work surface is very different from the way the saw

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blade is retracted in Retraction Embodiment #3. Tr. at 20:8-19 (“Q. All right. And let me put that demonstrative next to those figures from Complainants’ 83 and ask you whether, in your view, those two mechanisms on the left and on the right are substantially the same to an engineer? A. No, they are very different.”); *see also id.* at 20:20-25. For one thing, the actuator in the Retraction Embodiment #3 and the actuator in the Accused Products are substantially different. The evidence shows the actuators use entirely different types of energy to retract the saw blade. Retraction embodiment #3 uses elastic (*i.e.*, mechanical) energy in the compressed spring. *See, e.g.*, Tr. at 103:23-104:3. The Accused Products use chemical energy in the pyrotechnic explosive. *See, e.g.*, Tr. at 107:1-108:20. The evidence also shows the way in which each actuator is initiated is quite different. In Retraction Embodiment #3, when the detection system determines that a dangerous condition exists between a user and the saw blade, a charge is passed into the fuse wire, causing it to melt and then break. CX-083.0015-16; Tr. at 26:15-23. In contrast, in the Accused Products, when the detection system determines that a dangerous condition exists between a user and the saw blade, a charge is passed into the bridge wire that runs inside the pyrotechnic cartridge causing the bridge wire to heat up and ignite the material inside the cartridge. Tr. 24:1-5, 24:15-20, 350:16-354:1.

In Retraction Embodiment #3, the fuse wire, in combination with the compound linkage, acts to restrain the spring in its compressed position. Thus, in normal operation, the spring is continuously exerting force on the swing arm. Tr. at 24:15-26:23. When the fuse wire melts and breaks, the stored spring energy is released pushing the compound linkage apart and driving the arbor block below the work surface. CX-083.0015-16; Tr. at 18:22-19:10. Unlike the spring actuator in Retraction Embodiment #3, the pyrotechnic cartridge of the Accused Products, in normal operation, exerts no force on any part of the mechanism. Tr. at 24:15-26:23. When a

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dangerous condition is detected, the evidence shows the Accused Products create force-on-demand through ignition of the material in the pyrotechnic cartridge. *See, e.g.*, Tr. at 23:7-14; 107:5-108:3. The evidence shows that gas from the combustion of the material rapidly expands and propels a piston in the pyrotechnic cartridge downward to drive the swing-arm below the work surface. *Id.* at 107:5-108:3. Thus, I find the evidence shows the Accused Products act very differently from Retraction Embodiment #3 to retract the saw blade below the work surface.

Even Dr. Wolfe thought that these differences were more than insubstantial.

JUDGE PENDER: Do you have a preference, Doctor? You're saying they are both reasonable choices; right? If you're designing it, which one of the two do you like and why?

THE WITNESS: The performance characteristics are actually very similar, but I would have a preference for the spring. And the reason is the spring starts moving the blade faster.

So although it's quite safe to use the explosive and the depth of cut that you would get would be quite small, it would make me more comfortable to have the blade moving away from the finger as quickly as possible. And that happens in the spring-based embodiment.

Tr. at 425:18-426:13.

Taken as a whole, as set forth above, I do not find the differences between Retraction Embodiment #3 and the accused structure in the Accused Products in the way they perform the claimed function to be insubstantial.

SawStop argues that Bosch's evidence concerning equivalents under § 112 ¶ 6 is largely irrelevant because it focused on differences extraneous to the claimed function of the "reaction system." (*See* CReply at 5.) Specifically, SawStop points to the following evidence allegedly relied on by Bosch: (1) the unproven nature of Bosch's commercial pyrotechnic cartridge relative to SawStop's established brake cartridge; (2) the regulatory and shipping difficulties

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Dr. Gass anticipated when deciding whether to use an explosive-based system; (3) Dr. Wolfe's explanation that explosives may degrade over time, and (4) the fact that explosives are not permitted in Federal buildings. (*Id.*) SawStop also argues that Bosch's reliance on differences in resetting the pyrotechnic cartridge in the accused products versus resetting a spring-based system is irrelevant. (*Id.* at 6-7.) The caselaw is clear that my "inquiry should be restricted to the way in which the structure performs the properly-defined function and should not be influenced by the manner in which the structure performs other, extraneous functions." *Applied Medical v. U.S. Surgical Corp.*, 448 F.3d 1324, 1334 (Fed. Cir. 2006). I agree with SawStop that the above evidence is irrelevant and as such I have not relied on it in reaching my finding of non-equivalence herein.

SawStop relies heavily on what it refers to as the "known interchangeability test" to support its equivalency argument. (*See* CIB at 48-52.) But, "a finding of known interchangeability, while an important factor in determining equivalence, is certainly not dispositive." *See Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.*, 145 F.3d 1303, 1309 (Fed.Cir.1998). SawStop argues that Dr. Wolfe's testimony, the D2M design document, the Black & Decker patent, and Dr. Gass's early provisional applications demonstrate that persons skilled in the art at the time of the invention considered spring-based and explosive-based mechanisms to be interchangeable for the purpose of retracting a saw blade. I disagree. The evidence relied on by SawStop to conclude spring-based and explosive-based mechanisms were interchangeable only establishes that explosive-based mechanisms existed contemporaneously with the time of the filings of the asserted patents and that explosive-based mechanisms could potentially perform the claimed function of causing a predetermined action to

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take place relative to the saw blade upon detection of a dangerous condition. This, however, is insufficient to demonstrate an accused structure is equivalent.

“The question of known interchangeability is not whether both structures serve the same function, but whether it was known that one structure was an equivalent of another.” *See Chiuminatta Concrete Concepts v. Cardinal Indus., Inc.*, 145 F.3d 1303, 1309 (Fed.Cir.1998); *see also Bennett Marine, Inc. v. Lenco Marine, Inc.*, 549 F. App'x 947, 956 (Fed. Cir. 2013).

SawStop has failed to adduce any reliable evidence to show that the explosive-based mechanism was a known equivalent to the claimed spring-based mechanism. At best, the evidence presented only shows an explosive-based mechanism was considered an alternative potentially capable of performing the claimed function.

SawStop appears to confuse alternative with interchangeable. (*See*, e.g., CIB at 48 (“Again, Dr. Wolfe considered the claimed structures *as a whole*, and explained that a person or ordinary skill in the art would have considered the compressed spring-based structure in *Retraction Embodiment #3* and the pyrotechnic-based structure in the Accused Products to be two ‘alternatives that a designer would look at as to how to create the expansive force on the swing arm.’”), 48 (“The team was specifically tasked with evaluating different actuators for retracting a saw blade in response to detection of a dangerous condition. As a result of its evaluation, the team concluded that there were two “Viable Technologies”: a “Spring Mechanism” and a “Pyrotechnic Mechanism”), 50 (“Dr. Wolfe explained the significance of this evidence: “Well, it tells me that another person of ordinary skill in the art, the one who developed this patent, would have seen an explosive device or mechanical spring as reasonable alternative actuators for moving a swing arm holding a saw blade.”). The two concepts are not synonymous. For example, I can design a boat with either a sail or a motor to provide

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propulsion. And while the sail and motor are certainly known alternative ways of propelling a boat through water, they are not interchangeable and no one would ever consider them to be equivalent (*i.e.*, insubstantially different).

The difference between the Accused Products and SawStop's Retraction Embodiment #3 is not dissimilar to the difference between a sail and a motor. The motor operates upon stored chemical energy and the sail operates in such a way that it captures the force or stored energy available (the wind) when it is moved to capture it. Retraction Embodiment #3 is stored and restrained mechanical energy that already exists (like a furled sail before it captures the wind) and the accused product relies upon the potential chemical energy of the pyrotechnic device. *See Gen. Protecht Grp., Inc. v. Int'l Trade Comm'n*, 619 F.3d 1303, 1313 (Fed. Cir. 2010) ("As we held in *Toro Co. v. Deere & Co.*, 355 F.3d 1313 (Fed. Cir. 2004), one system that accomplishes a function mechanically and another system that accomplishes the same function using magnetic force 'function in fundamentally different ways.'")

b. "motion detection system"

The Parties' Positions

SawStop

SawStop argues that the Accused Products literally include a "motion detection system adapted to detect motion of the working portion and to disable the reaction system when the working portion is not moving." (CIB at 56.) SawStop contends that the motion detection system in the Accused Products [

] (*Id.*) SawStop argues that the system includes [

] (*Id.*) SawStop argues that software executing on a microprocessor called []

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processes signals from the [

] (*Id.*) SawStop contends that when the motor is

turned off during operation, [

] (*Id.*) SawStop argues that at this point the software

executing on the microcontroller processes the [] outputs to determine whether the

speed falls into an interval from zero and 240 rpm. (*Id.*) SawStop asserts that if the rotational

speed falls into this interval—including zero rpm—then the blade is deemed “stopped.” (*Id.*)

If the blade is deemed “stopped,” SawStop argues the software transitions from [

] and beings a process to disable the reaction system.

(*Id.*) SawStop contends the process to disable the reaction system includes discharging the firing

capacitor—a process that takes approximately half a second. (*Id.*) SawStop argues that this time

period is sufficiently long for the blade to slow down most or all of the way before the capacitor

is fully discharged. (*Id.*) SawStop argues the reaction system will remain disabled until the

motor is restarted, at which point the control system will recharge the firing capacitor. (*Id.*)

SawStop argues that even assuming there are circumstances in which the Accused Products disable the reaction system while the saw blade is still rotating, the evidence demonstrates that this is not always the case, and there are other circumstances in which the Accused Products will disable when the blade has completely stopped moving.

SawStop argues that even if the reaction system were disabled when the rotational speed of the blade hits 240 rpm that is not the end of the inquiry. SawStop argues that the [] microcontroller continues disabling the reaction system after the blade has come to a stop, and only reactivates the reaction system when the motor is restarted and power is supplied to the motor and the control system recharges the firing capacitor. CIB at 57. Thus, SawStop

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contends, even if the “reaction system” is disabled at a non-zero speed, [] will maintain this “reaction system” as disabled while the blade is stopped (*i.e.*, “not moving”) until the motor is once again turned on and the “reaction system” is re-enabled by the source code.

SawStop argues that it is well settled that an accused device that “sometimes, but not always, embodies a claim[] nonetheless infringes.” SawStop argues that the evidence establishes that, even if there are circumstances in which the reaction system may be disabled when the blade is spinning, there are also situations where the reaction system will not be disabled until after the blade has stopped moving. SawStop argues that in these circumstances, the motion detection system in the Accused Products disables the reaction when the blade is not moving, thereby literally meeting the requirements of claim 8 of the ‘712 patent under my construction of the term “not moving.”

Bosch

Bosch argues that the evidence at the hearing demonstrated that the REAXX saw’s reaction system is disabled when the blade is still moving. (RRB at 22.) Bosch contends that settings in the REAXX saw are governed by a protocol in [] (the second of two microprocessors in the internal electronics of the saw) called a state machine. (*Id.* at 23.) Bosch argues that when the initial power to the saw is turned on, [

] (*Id.*) [

] (*Id.*) [

] (*Id.*) According to Bosch, when a user turns on the motor, [] (*Id.*) [

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] (*Id.*) Bosch asserts that [

] (*Id.*) When a user turns off the motor, Bosch contends that [] (*Id.*) Bosch argues that

[] (*Id.*) Bosch argues that during coast-down, while the blade is still spinning, [

] (*Id.*)

Bosch contends Mr. Laliberte demonstrated exactly how fast the REAXX saw is spinning when the reaction system is disabled. (*Id.* at 24.) [

] (*Id.*) By contrast, Bosch argues Dr. Wolfe never did any testing at all before rendering his opinion about when the system is disabled, not even a simple visual test. (*Id.* at 25.)

Discussion

Infringement is a question of fact. “To establish literal infringement, every limitation set forth in a claim must be found in an accused product, exactly.” *Microsoft Corp. v. GeoTag, Inc.*, 817 F.3d 1305, 1313 (Fed. Cir. 2016) (quoting *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed.Cir.1995)). SawStop has the ultimate burden of persuasion on infringement and thus carries the risk of non-persuasion.

Claim 8 requires a “motion detection system adapted to detect motion of the working portion and to disable the reaction system when the working portion is not moving.” In Order No. 11, I construed “not moving” to mean “stopped.” For the reasons discussed in more detail below, I find SawStop has failed to prove that the Accused Products include a motion detection

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system adapted to disable the reaction system when the working portion (*i.e.*, saw blade) is not moving. Contrary to SawStop's contention, the evidence does not show the alleged motion detection system in the Accused Products disables the reaction system when the saw blade is stopped. Rather, I find substantial evidence shows the alleged motion detection system in the Accused Products disables the reaction system while the saw blade is still moving.

The motion detection system in the Accused Products [] to determine when to disable the blade-retraction system. Tr. at 455:18-456:21, 366:8-378:11, 753:24-754:24. The system includes a [] Tr. at 367:18-369:11, 753:24-754:24; JX-022C.76-78; CX-182C.19. A microprocessor called [] (the second of two microprocessors in the internal electronics of the saw) processes signals from the [] Tr. at 455:18-456:2, 368:20-370:1; CX-183C.3.

The evidence shows the settings in the REAXX saw are governed by a protocol in [] called a state machine. Tr. at 737:20-738:9, 758:11-20, 760:18-19, 800:21-801:2. When the initial power to the saw is turned on, [] Tr. at 758:21-759:2. []

] *Id.* []

] Tr. at 759:1-2.

The evidence shows that when a user turns on the motor, [] Tr. at 759:3-5, 760:18-25, 803:7-18. []

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] ⁴ See Tr. at, e.g., 760:18–25. [

]

CX-182C at 36. The evidence shows that [

[

] See e.g., Tr. at 760:18–25, 820:17–821:6.

When a user turns off the motor, [

] Tr. at 759:6–11. During coast-down,

while the blade is still spinning, the evidence shows [

] and thus disables the reaction system. Tr. at 805:14–17.

At the hearing, Mr. Laliberte convincingly demonstrated exactly how fast the REAXX saw is spinning when the reaction system is disabled. To do so, he performed a test that showed via a change in the REAXX display from a yellow light to a green light the point at which the saw changes to [] during coast-down.⁵

[Mr. Laliberte]: Okay. Engaging bypass mode, I'm pressing -- holding the bypass button and turning on the switch.

⁴ [

] CX-182C at 10, 11, and 14. [

] *Id.* at 11. [

] Tr. at 738:19–23.

⁵ [

] Tr. at 759:16–23. [

] *Id.* [

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JUDGE PENDER: Okay. Let the record reflect that the witness pushed a button on the left-hand side of the saw, if he's facing the saw, and he called that a bypass button. And then he turned -- he pulled the paddle, on/off paddle up, and it turned the saw blade on, but the yellow display light turned on. He allowed it to run for several seconds, whereupon he turned it off, he pushed the paddle in the down position to turn it off. And the yellow light stayed on for approximately 2 seconds before it turned green. Is that about -- would you agree with my assessment?

THE WITNESS: I think that's reasonable, sir.

JUDGE PENDER: Yeah.

BY MR. HANNEMANN: Was the blade spinning -- just for the record, was the blade spinning when the light turned green?

JUDGE PENDER: Yes.

MR. HANNEMANN: So we don't need to do it again?

JUDGE PENDER: No, I saw it.

MR. HANNEMANN: Gotcha.

JUDGE PENDER: I don't know how fast it was spinning, but it was spinning. Mr. Gerchick, did you observe the same thing I observed?

MR. GERCHICK: I did. I'm cross-examining this witness; right?

JUDGE PENDER: Yeah.

(Laughter.)

JUDGE PENDER: Just to make sure, I have it set in the record, set in my mind. We'll do it again if you didn't observe what I observed.

MR. GERCHICK: No, I will confirm that I saw that the blade was moving when the light turned green. I don't know what speed it was, but I saw that the blade was moving when the light turned green.

JUDGE PENDER: Okay. That's scary. I wouldn't want to use that in bypass mode. But anyway, keep going.

Tr. at 761:6-762:20.

As set forth above, I find substantial evidence shows that the motion detection system in the Accused Products disables the "reaction system" while the blade is still spinning.

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SawStop argues the reaction system in the Accused Products is not disabled until after the firing capacitor is fully discharged and that discharging the firing capacitor takes more time than it does for the blade to stop. I disagree.⁶ While it is true that the firing capacitor needs to be charged for the pyrotechnic to fire, it is incorrect to infer from that fact that the system is disabled at whatever moment during the discharge process the power remaining in the discharging capacitor is no longer sufficient to ignite the pyrotechnic. As set forth in detail above, [

] ⁷ This is further elucidated in the following excerpts from the evidentiary hearing.

[

]

⁶ As I observed, the Bosch saw's reaction system will turn off while the blade spins. This conclusively establishes Bosch's point. Whether this is as safe as a system that leaves the system on until the blade stops completely is not at issue. However, I can envision various reasons for not firing the device when the blade is moving very slowly.

⁷ Dr. Wolfe admitted the [] happens before the capacitor begins to discharge. Tr. at 511:15-19.

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[

]

Tr. at 820:17–821:6. Thus, regardless of whether it takes the capacitor 1 millisecond or 10 seconds to discharge, I find the evidence conclusively establishes the reaction system stops being.

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able to fire as soon as the REAXX saw [] which occurs while the blade is still moving.

SawStop contends “the process to disable the reaction system includes discharging the firing capacitor” and that “during the course of this discharge period . . . the reaction system can be triggered until its capacitor has been sufficiently discharged.” (CIB at 57, 59.) In support, SawStop relies entirely on the testimony of its expert Dr. Wolfe. (*See Id.* at 57 (citing Tr. at 375:1-377:14; CX-216C at [] lines 1079-1104), 59 (citing Tr. at 511:15-512:5).) At the hearing Dr. Wolfe testified on cross examination:

Q Right. And the [] turns off the blade dropping system; correct?

A No.

Q No it does not?

A No. The -- I went back through the software, and I also looked at some comments in the manual. The detection system stays on and would be able to trigger that system still, until the capacitor is discharged.

Tr. at 511:23-512:5. Dr. Wolfe’s convenient pronouncement at the hearing that he “went back through the software” and now concluded the detection system stays on and would be able to trigger the system until the capacitor is discharged is primarily supported by Dr. Wolfe’s interpretation of a comment in the [] Tr. at 375:1-377:14. I note, nowhere does Dr. Wolfe actually point to the code itself to show the reaction system is not disabled until the firing capacitor is discharged.⁸ Dr. Wolfe only points to a single comment, which states:

[]

⁸ Nor did Dr. Wolfe do any tests to measure or even look at when the alleged reaction system in the Accused Products turns off during coast-down. Tr. at 510:12-18.

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[]

CX-216C at 1. The above comment relates to [

] This, however, is not the situation at the crux of the parties' argument. The dispute between the parties centers on what is happening from the time the motor is turned off and the saw [] to the time the saw blade is stopped. What is happening "where motor is turned on" is irrelevant. Setting that aside, even if I were inclined (and I am not) to credit Dr. Wolfe's testimony on this particular issue, at best the above comment only demonstrates [

] Nowhere does the comment discuss any connection between the disabling of the alleged reaction system in the Accused Products and the discharging of the firing capacitor. Nor does the comment teach that the alleged reaction system can be triggered until its capacitor has been sufficiently discharged. In fact, the comment does not even mention the alleged reaction system at all.

Having reviewed all the evidence relied on by SawStop, including the testimony of Dr. Wolfe, I simply find no credible basis to believe the alleged reaction system in the Accused Products remains enabled (*i.e.*, able to trigger/fire) after [

] To the contrary, as set forth in detail, *supra*, I find the evidence conclusively shows (including based upon my own observation of the device) that [

] Thus, the evidence clearly shows that when the state switches to default mode the alleged reaction system is disabled.

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SawStop's final argument is that even if the reaction system were disabled when the rotational speed of the blade hits 240 rpm that is not the end of the inquiry, because the [] microcontroller continues disabling the reaction system after the blade has come to a stop, and only reactivates the reaction system when power is supplied to the motor. SawStop's argument implies that a motion detection system that shuts off the reaction system at any time before the blade is stopped, and maintains that state for as long as the blade is stopped, meets the limitation of claim 8 requiring a "motion detection system adapted . . . to disable the reaction system when the working portion is not moving." I disagree.

Contrary to SawStop's argument, the express language of the claim requires the detection system to perform the action of disabling the reaction system (*i.e.*, going from being enabled to disabled) when the blade is stopped. Thus, a detection system that disables the reaction system before the blade is stopped fails to meet this claim language, regardless of whether the reaction system remains disabled when the blade finally comes to a stop. Under SawStop's theory, a system that disables the reaction system as soon as the motor is turned off would infringe this limitation because the reaction system would be disabled until the motor is once again turned on. This is not what claim 8 requires.

As discussed in detail, *supra*, substantial evidence shows that the alleged reaction system in the Accused Products is disabled while the blade is still spinning, not when the blade is stopped. Accordingly, I find the Accused Products do not include the claimed motion detection system. Thus, I find SawStop has failed to prove the Accused Products infringe claim 8 of the '712 patent.

PUBLIC VERSION**2. Claims 9, 11, and 15**

Claims 9 and 11 depend from claim 8. Claim 15 depends from claim 11, which in turn depends from claim 8. For the reasons discussed, *supra*, with respect to claim 8 of the '712 patent, I find the Accused Products do not infringe dependent claims 9, 11 and 15.

3. Claim 18

At the hearing, SawStop presented significant testimony in support of its argument that the Accused Products infringe independent claim 18 of the '712 patent. The uncontested evidence shows the Accused Products are woodworking machines that include a cutting tool in the form of a saw blade. The saw blade is mounted to an arbor that is driven by a motor to spin the saw blade in operation. Tr. at 401:11-23, 339:18-340:21; RPX-2; CX-181C; CX-232C. The uncontested evidence also shows the Accused Products include a "detection system" for the same reasons discussed above with respect to claim 8 of the '712 patent. *See* Section V.D.1, *supra*; *see also* Tr. at 401:24-403:5, 340:22-341:6, 346:12-348:11.

Bosch argues the Accused Products do not infringe claim 18 for two reasons: (1) the Accused Products do not have the claimed "reaction system;" and (2) the Accused Products do not include "a control system . . . where the control system is adapted to . . . deactivate the reaction system after coast-down."

a. "reaction system"

The parties raise the same arguments with regard to the "reaction system" limitation in claim 18 as they did with regard to claim 8. Thus, for the same reasons set forth above with respect to claim 8, I find the Accused Products do not include the reaction system of claim 18 of the '712 patent.

b. "control system"

Claim 18 further recites "a control system adapted to monitor the detection system and

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control actuation of the reaction system, where the control system is adapted to trigger the reaction system if the dangerous condition is detected when the motor is spinning the cutting tool or during coast-down of the cutting tool after the motor is turned off and to deactivate the reaction system after coast-down.” In Order No. 11, I properly construed the term “after coast-down” to mean “the time after coast-down when the cutting tool is stopped.” Order No. 11 at 45. Under this construction, SawStop does not argue the Accused Products literally infringe the claimed “control system.” Rather, SawStop only argues the Accused Products infringe the “control system” limitation of claim 18 under the doctrine of equivalents.

There appears to be no dispute that the Accused Products include a control system that monitors the detection system and controls actuation of the reaction system. Tr. at 446:8-447:12; JX-022C at 98:7-99:8. Nor does there appear to be a dispute that the control system in the Accused Products is adapted to trigger the reaction system if the dangerous condition is detected when the motor is spinning the cutting tool or during cost-down of the cutting tool after the motor is turned off. Tr. at 447:13-448:22. The evidence shows the Accused Products have a Normal Cutting mode, during which the motor is spinning the saw and the detection system algorithms and reaction system are both active to fire the pyrotechnic if a person contacts the blade. Tr. at 447:13-448:5, 802:20-803:22. [

] Tr. at 447:13-448:5,

803:24-807:3; JX-022C at 124:5-125:13.

The parties’ dispute centers around the final requirement of the “control system,” namely

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that the “control system ... is adapted ... to deactivate the reaction system after coast-down.”

SawStop’s argument that the control system in the Accused Products is equivalent to the claimed control system is premised on SawStop’s contention that the control system disables the reaction system when the saw blade is either stopped or imperceptibly moving. (CIB at 62-63; *see also id.* at 16, 59-60.) This contention is based on the same arguments SawStop made with regard to the “motion detection system” in claim 8, that the reaction system is not disabled until the firing capacitor is substantially discharged and that during the time it takes for the capacitor to substantially discharge the saw blade will either slow to a complete stop or be moving so slowly as to be imperceptible. As set forth in detail, *supra*, I find substantial evidence contrary to this argument. In particular, I have found that the reaction system is disabled when the [

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the saw blade is still spinning. *See* Section V.D.1(b), *supra*; *see, e.g.*, Tr. at 761:6–762:20.

SawStop, who bears the burden of persuasion, has not presented any testimony or evidence that under these facts the control system in the Accused Products is equivalent to the claimed control system requiring disabling the reaction system at the point in time after coast-down when the cutting tool is stopped. (*See* CIB at 63-66.)

SawStop argues the control system in the Accused Products performs substantially the same function, in substantially the same way, to reach substantially the same result as the claimed control system. I disagree. In particular, I disagree at least with SawStop’s argument that the accused control system and the claimed control system perform substantially the same function and achieve substantially the same result.

SawStop contends “[t]he function of the claimed control system is to avoid activation of the reaction system when there is no chance or only a minimal chance of harm to the user,” but

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fails to provide a single citation or argument in support of that contention. (CIB at 64.)

SawStop's recitation of the function of the claimed control system is overly broad and divorced from the actual claim language. Here, the claim language itself explicitly sets forth the functions of the "control system." Specifically, claim 18 requires a control system adapted to:

(1) "monitor the detection system;" (2) "control actuation of the reaction system;" (3) "trigger the reaction system if the dangerous condition is detected when the motor is spinning the cutting tool or during coast-down of the cutting tool after the motor is turned off;" and (4) "deactivate the reaction system after coast-down."

As discussed above, the parties only dispute whether the control system in the Accused Products is adapted to deactivate the reaction system after coast-down. Thus, for purposes of adjudicating SawStop's doctrine of equivalents argument the "function" of the claimed control system is "to deactivate the reaction system after coast-down." The evidence, as discussed *supra*, shows the Accused Products do not deactivate the reaction system after coast-down, but rather deactivate the reaction system while the saw blade is still spinning. The evidence suggests this difference in function is not insubstantial. *See, e.g.*, Tr. at 761:6–762:20.

SawStop contends the result achieved by the claimed control system is to maintain operability of the reaction system when the saw blade presents a serious danger to the user, and relatedly, to prevent activation of the reaction system when the saw blade does not present a serious danger to the user. I disagree. The result of the claimed control system is that the reaction system is disabled when the saw blade is stopped. The result achieved by the accused control system is that the reaction system is disabled when the saw blade is still moving. The evidence suggests these results are not insubstantially different as there is greater potential for injury while a cutting tool is still moving than after it has stopped. Tr. at 28:6–22, 762:22–763:9.

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The only equivalence testimony SawStop relies on is premised on its argument that the reaction system is not disabled until the capacitor is discharged and that by the time the capacitor is discharged the saw blade would either be stopped or barely rotating. As discussed *supra*, I find this argument to be contrary to the evidence. SawStop argues that the accused control system and the claimed control system perform substantially the same function and achieve substantially the same result. But, as discussed above, these arguments too are contrary to the evidence. Therefore, I find for at least the reasons above that SawStop has failed to show the accused control system infringes the claimed “control system” limitation of claim 18 of the ‘712 patent under the doctrine of equivalents.

As discussed, *supra*, SawStop only argues that the Accused Products infringe the claimed control system under the doctrine of equivalents. SawStop does not make a literal infringement argument here. Because SawStop has failed to show the Accused Products include the claimed “control system” limitation, I must find SawStop has failed to show the Accused Products infringe claim 18 of the ‘712 patent. *Conroy v. Reebok Int’l, Ltd.*, 14 F.3d 1570, 1572 (Fed. Cir. 1994) (“With regard to the second step of the infringement analysis, the patentee must prove that the accused device embodies every limitation in the claim, either literally or by a substantial equivalent.” (citation omitted)).

4. Claim 20

Claim 20 depends from claim 18, and recites, “[t]he woodworking machine of claim 18, where the control system is adapted to re-activate the reaction system when the motor starts spinning the cutting tool after deactivation of the reaction system.” For the reasons discussed, *supra*, with respect to claim 18 of the ‘712 patent, I find the Accused Products do not infringe dependent claims 20 of the ‘712 patent.

PUBLIC VERSION**E. Domestic Industry - Technical Prong**

SawStop argues the Domestic Industry Products practice claims 8, 9, 11, 12, and 18-20 of the '712 patent. Bosch did not provide any arguments to the contrary in its post-hearing briefs. Thus, I find pursuant to my Ground Rules that Bosch has waived its right to argue the Domestic Industry Products do not practice the '712 patent.

1. Claim 8

The evidence adduced at the hearing shows the Domestic Industry Products practice independent claim 8 of the '712 patent. In particular, the evidence shows each Domestic Industry Product is a woodworking machine, and in particular a table saw that includes a table top, cabinet base, trunnion brackets, trunnions, an arbor block, an arbor, a saw blade, and a motor. Tr. at 247:11-251:19; CPX-1; CX-104; CX-110; CX-144; CX-244. The saw blade is a working portion adapted to work when driven by the motor. Tr. at 498:11-18, 247:11-251:19; CPX-1; CX-104; CX-110; CX-144; CX-244.

The evidence also shows the Domestic Industry Products include "a detection system adapted to detect a dangerous condition between a person and the working portion by imparting an electric signal to the working portion and monitoring the electric signal for at least one change indicative of the dangerous condition." Tr. at 498:11-18, 489:6-490:1, 478:20-479:13.

Specifically, the evidence indicates the contact-detection system of the Domestic Products works by recognizing differences between the electrical properties of wood or other non-conductive materials and a person. Tr. at 262:4-14; CX-104.12. The system imparts an electrical signal onto the blade, and then monitors that signal for changes caused by contact with a person's body. *Id.* When a person touches the blade, the signal changes because of the relatively large inherent capacitance and conductivity of the person's body as compared to wood or another low-conductivity material. *Id.*

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The evidence shows the detection system includes an electrode shell assembly having two electrodes that surrounds the saw's arbor. Tr. at 262:15-264:13; CX-164C; CX-208C. One of the electrodes imparts a signal onto the saw blade through capacitive coupling with the arbor, while the other electrode senses the signal. Tr. at 262:15-264:13; CX-164C; CX-208C. A digital signal processor (DSP) and associated electronics mounted on a printed circuit board in the brake cartridge of the Domestic Products generate and monitor the signal imparted onto the saw blade. Tr. at 266:25-267:22; CX-162C.2-4. Software on the DSP executes four detection algorithms that determine whether changes in the signal are characteristic of a user contacting the blade. Tr. at 267:23-268:12. For example, one of the algorithms calculates a sum of the absolute signal changes over an 80-microsecond period and compares the sum to a threshold value. Tr. at 268:13-269:15; CX-218C.389. If the sum exceeds the threshold, then the software sets a flag to fire the reaction system. Tr. at 268:13-269:15; CX-218C.389. SawStop's expert convincingly testified that these elements meet the requirements of the "detection system" limitation because they detect a dangerous condition between a person and the saw blade by imparting an electric signal to the saw blade and monitoring the electric signal for at least one change indicative of a dangerous condition resulting from human contact with the saw blade. Tr. at 498:11-18, 489:6-490:1, 478:20-479:13.

In addition, the evidence shows the Domestic Industry Products include "a reaction system associated with the detection system to cause a predetermined action to take place relative to the working portion upon detection of the dangerous condition" under 35 U.S.C. § 112 ¶ 6. As discussed *supra*, I find SawStop's proposed Braking Embodiment #1 (*i.e.*, the combination of a brake pawl, spring, and fuse wire) to be structure corresponding to the claimed reaction system's claimed function of causing a predetermined action to take place relative to the

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cutting tool/working portion upon detection of a dangerous condition. The evidence demonstrates that the reaction system in the Domestic Industry Products includes the combination of a brake pawl, spring, and fuse wire. Tr. at 490:2-491:17, 269:24-272:1; CX-104.11; CX-142C.1; CX-166C; CX-167C. In normal operation, the fuse wire holds the spring in compression against the brake pawl. Tr. at 269:24-272:1; CX-166C; CX-167C. However, in response to the detection of a dangerous condition, software executing on the DSP in the brake cartridge turns on two lines that activate the gate of an SCR that acts as an electronic switch. Tr. at 269:24-270:11; CX-162C.3. Opening the SCR allows a high-voltage capacitor to rapidly discharge a large amount of charge through a fuse wire in the brake cartridge. Tr. at 269:24-270:11; CX-162C.3. The evidence shows that when the high-voltage capacitor discharges through the fuse wire, the fuse wire fails and releases stored energy in the compressed spring to push the brake pawl against the spinning saw blade, thereby stopping rotation of the blade. Tr. at 269:24-272:1; CPX-7; CX-166C; CX-167C.

Further, the evidence shows that each Domestic Industry Product includes a “motion detection system adapted to detect motion of the working portion and to disable the reaction system when the working portion is not moving.” Tr. at 499:1-500:3, 491:18-496:25. The motion detection system measures the rotational speed of the saw blade in order to determine when to disable the reaction system. Tr. at 281:7-284:16. The motion detection system includes a Hall-effect sensor that detects a magnetic field generated by a magnet mounted to the saw arbor. Tr. at 281:22-282:8, 283:19-284:6; CX-170C. As the arbor rotates to spin the saw blade, the magnet passes by the Hall-effect sensor and generates a signal that is transmitted to a processor mounted in the brake cartridge. Tr. at 281:22-282:8, 283:19-284:6; CX-170C. Software executing on the processor reads the signals and determines the rotational speed of the

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saw blade. Tr. at 281:22-283:7, 284:7-16; CX-218C.102.

When the motor is powered off and the saw blade begins to coast down, the evidence shows the software executes a predictive algorithm that constantly updates a prediction of the point at which the saw blade will stop and sets a counter for how long to wait to turn off the reaction system. Tr. at 282:9-283:7; CX-218C.102. As the saw blade rotational speed gets closer and closer to zero, the counter gets shorter and shorter. Tr. at 282:9-25; CX-218C.102. When the counter expires, the software disables the reaction system. Tr. at 282:9-25; CX-218C.102. The reaction system is disabled when the saw blade rotational speed is stopped. Tr. at 283:1-7, 284:14-16. In some situations the software may disable the reaction system at a point just prior to the saw blade stopping, but the evidence shows the rotational speed at this point would be imperceptible to a user. Tr. at 283:1-7. The reaction system remains disabled until the blade starts to spin again, at which point the software re-enables it. Tr. at 283:8-18.

Accordingly, based on the undisputed evidence, I find SawStop has proven by a preponderance of the evidence that the Domestic Industry Products practice claim 8 of the '712 patent.

2. Claim 9

Claim 9 depends from claim 8, and recites, "[t]he woodworking machine of claim 8, where the working portion is a spinning blade and where the motion detection system detects whether the blade is spinning." JX-016 at 12:51-53. The evidence shows the working portion in the Domestic Industry Products is a spinning saw blade, and the motion detection system includes a Hall effect sensor and associated electronics and software that detect whether the blade is spinning. Tr. at 499:1-500:3, 281:22-282:8, 283:19-284:6; CX-170C; CX-218C.102.

Accordingly, based on the undisputed evidence, I find SawStop has proven by a preponderance of the evidence that the Domestic Industry Products practice claim 9 of the '712

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patent.

3. Claim 11

Claim 11 depends from claim 8, and recites, “[t]he woodworking machine of claim 8, where the motion detection system includes a sensor.” JX-016 at 12:58-59. The evidence shows the motion detection system in the Domestic Industry Products includes a Hall-effect sensor. Tr. at 499:1-500:21, 281:22-282:8, 283:19-284:6; CX-170C; CX-218C.102.

Accordingly, based on the undisputed evidence, I find SawStop has proven by a preponderance of the evidence that the Domestic Industry Products practice claim 11 of the ‘712 patent.

4. Claim 12

Claim 12 of the ‘712 patent depends from claim 11 and recites, “[t]he woodworking machine of claim 11, where the sensor is a Hall effect sensor.” The evidence shows the motion detection system in the Domestic Industry Products includes a Hall-effect sensor. Tr. at 499:1-500:21, 281:22-282:8, 283:19-284:6; CX-170C; CX-218C.102.

Accordingly, based on the undisputed evidence, I find SawStop has proven by a preponderance of the evidence that the Domestic Industry Products practice claim 12 of the ‘712 patent.

5. Claim 18

The evidence adduced at the hearing shows the Domestic Industry Products practice independent claim 18 of the ‘712 patent. In particular, the evidence shows the Domestic Industry Products are woodworking machines that include a cutting tool in the form of a saw blade. The saw blade is mounted to an arbor that is driven by a motor to spin the saw blade in operation. Tr. at 489:6-14, 247:11-251:19; CPX-1; CX-104; CX-110; CX-144; CX-244. The evidence also shows the Domestic Industry Products include a “detection system” for the same

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reasons discussed above with respect to claim 8 of the '712 patent. *See* Section V.E.1, *supra*; *see also* Tr. at 489:6-490:1, 478:20-479:13. In addition, the evidence shows the Domestic Industry Products include a "reaction system" for the same reasons discussed above with respect to claim 8 of the '712 patent. *See* Section V.E.1, *supra*; *see also* Tr. at 490:2-491:17.

Further, the evidence shows the Domestic Industry Products include "a control system adapted to monitor the detection system and control actuation of the reaction system, where the control system is adapted to trigger the reaction system if the dangerous condition is detected when the motor is spinning the cutting tool or during coast-down of the cutting tool after the motor is turned off and to deactivate the reaction system after coast-down." In Order No. 11 I construed the phrase "after coast down" to mean "the time after coast-down when the cutting tool is stopped." Order No. 11 at 45. As discussed in more detail below, the evidence shows that under this construction the Domestic Industry Products meet the "control system" limitation under the doctrine of equivalents. Tr. at 491:18-496:25.

Specifically, the evidence demonstrates that the control system measures the rotational speed of the saw blade in order to determine when to disable the reaction system. Tr. at 281:7-284:16. The motion detection system includes a Hall-effect sensor that detects a magnetic field generated by a magnet mounted to the saw arbor. Tr. at 281:22-282:8, 283:19-284:6; CX-170C. As the arbor rotates to spin the saw blade, the magnet passes by the Hall-effect sensor and generates a signal that is transmitted to a processor mounted in the brake cartridge. Tr. at 281:22-282:8, 283:19-284:6; CX-170C. Software executing on the processor reads the signals and determines the rotational speed of the saw blade. Tr. at 281:22-283:7, 284:7-16; CX-218C.102.

When the motor is powered off and the saw blade begins to coast down, the evidence

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shows the software executes a predictive algorithm that constantly updates a prediction of the point at which the saw blade will stop and sets a counter for how long to wait to turn off the reaction system. Tr. at 282:9-283:7; CX-218C.102. As the saw blade rotational speed gets closer and closer to zero, the counter gets shorter and shorter. Tr. at 282:9-25; CX-218C.102. When the counter expires, the evidence shows that the software disables the reaction system. Tr. at 282:9-25; CX-218C.102. The evidence shows that in some situations the software may disable the reaction system at a point just prior to the saw blade stopping, but the rotational speed at this point would be imperceptible to a user. Tr. at 283:1-7.

The evidence demonstrates that any differences between the control system in the Domestic Industry Products and a control system that disables a reaction system “after coast-down when the cutting tool is stopped” would be insubstantial. Tr. at 282:9-283:7, 495:22-496:25. As described above, the control system in the Domestic Industry Products attempts to predict the point at which the blade will stop rotating, and disables the reaction system at that time. Tr. at 282:9-283:7, 495:22-496:25; CX-218C.102. As Dr. Wolfe explained, the Hall effect sensor measurements are relatively coarse, and therefore the predictive algorithm is used to determine as accurately as possible the point at which the saw blade will stop rotating. Tr. at 495:22-496:25. As Dr. Gass explained, there may be situations when the predictive algorithm decides to disable the reaction system at a moment just prior to the blade stopping; however, the rotational speed of the blade at this point would be imperceptible to the user:

Q. So how close to zero does the processor switch the reaction system off?

A. As near as it can discern to zero. I mean, for all intents and purposes, it’s exactly. You know, from a human perception standpoint, you couldn’t tell the difference between whether it was at zero, slightly before or just slightly after.

Tr. at 283:1-7.

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The evidence also shows that the control system in the Domestic Industry Products performs the same or substantially same function in the same or substantially same way to achieve the same or substantially same result as a control system adapted to deactivate the reaction system after the blade has stopped rotating. The function of the claimed control system is to avoid activation of the reaction system when there is no chance or only a minimal chance of harm to the user. I find the Domestic Industry Products perform the same or substantially same function because the predictive algorithm disables the reaction system as close as possible to the point at which the blade rotation has stopped. Tr. at 282:9-283:7, 495:22-496:25; CX-218C.102. In fact, the evidence shows that at this point, the rotational speed of the saw blade is—at most—imperceptible. Tr. at 282:9-283:7, 495:22-496:25; CX-218C.102. The way in which the claimed control system performs the function is by using a sensor to monitor rotation of the saw blade, and conditioning the operation of the reaction system on a determination of whether the saw blade is moving. I find the control system in the Domestic Industry Products performs the function in the same or substantially same way by using a magnetic Hall-effect sensor to monitor rotation of the saw blade and process signals to predict the point in time when the saw blade will stop rotating. Tr. at 281:22-284:6, 495:22-496:25; CX-170C. The result achieved by such a control system is to maintain operability of the reaction system when the saw blade presents a serious danger to the user, and relatedly, to prevent activation of the reaction system when the saw blade does not present a serious danger to the user. I find the control system in the Domestic Industry Products achieves the same or substantially same result by disabling the reaction system as close as possible to the point at which the blade is no longer rotating. Tr. at 282:9-283:7, 495:22-496:25.

Accordingly, based on the uncontested evidence, I find SawStop has proven by a

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preponderance of the evidence that the Domestic Industry Products practice claim 18 of the '712 patent.

6. Claim 19

Claim 19 of the '712 patent depends from claim 18, and recites, “[t]he woodworking machine of claim 18, where the reaction system is a brake system, and where the predetermined action is to engage and stop the working portion.” The evidence shows the reaction system in the Domestic Industry Products includes a brake cartridge that performs the predetermined action of engaging and stopping the saw blade’s rotation. Tr. at 490:2-491:17, 497:1-11, 269:24-272:1; CX-104.11; CX-142C.1; CX-166C; CX-167C.

Accordingly, based on the uncontested evidence, I find SawStop has proven by a preponderance of the evidence that the Domestic Industry Products practice claim 19 of the '712 patent.

7. Claim 20

Claim 20 of the '712 patent depends from claim 18, and recites, “[t]he woodworking machine of claim 18, where the control system is adapted to re-activate the reaction system when the motor starts spinning the cutting tool after deactivation of the reaction system.” The evidence shows that after the control system in the Domestic Industry Products disables the reaction system, the reaction system will remain disabled until the motor is restarted, at which point the control system will recharge the firing capacitor in order to re-enable the reaction system. Tr. at 497:12-498:10.

Accordingly, based on the uncontested evidence, I find SawStop has proven by a preponderance of the evidence that the Domestic Industry Products practice claim 20 of the '712 patent.

PUBLIC VERSION**VI. U.S. PATENT NO. 7,600,455****A. Level of Ordinary Skill in the Art**

In Order No. 7 I found a person of ordinary skill in the art with respect to the '712 patent at the time of the invention would have had either an undergraduate degree in mechanical engineering and substantial coursework in electrical engineering, or an undergraduate degree in electrical engineering and substantial coursework in mechanical engineering, plus three to five years of professional experience in mechatronics and familiarity and experience with woodworking machines, including a basic understanding of how the machines operate. *See* Order No. 7 at 5.

B. Claims-at-Issue

The following claims of the '455 patent are at-issue in this investigation.

1. A woodworking machine comprising:

a cutting tool for cutting workpieces;

a motor configured to drive the cutting tool;

a detection system configured to detect a dangerous condition between a person and the cutting tool;

a reaction system controllable to disable the cutting tool if the dangerous condition is detected; and

a control system configured to determine the operability of the reaction system without having to operate the reaction system and to disable the motor if the reaction system is inoperable.

5. The machine of claim 1, where the reaction system includes at least one replaceable single-use component, and where the control system is configured to detect whether the single-use component has been used, and if so, to disable the motor until the single-use component has been replaced.

10. The machine of claim 1, where the reaction system is adapted to be electrically coupled to the control system, and where the control system is

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configured to disable the motor if the reaction system is not coupled to the control system.

14. A woodworking machine comprising:

a cutting tool for cutting workpieces;

a detection system adapted to detect a dangerous condition between a user and the cutting tool;

a reaction system adapted to disable the cutting tool when the detection system detects the dangerous condition; and

a control system adapted to monitor the detection system and control actuation of the reaction system; where the control system is adapted to test at least a portion of the reaction system to verify that the portion of the reaction system is operational without having to operate the reaction system.

15. The machine of claim 14, further including a motor controllable by the control system to drive the cutting tool, and where the control system is adapted to test the portion of the reaction system prior to actuation of the motor, and where the control system is adapted not to actuate the motor unless the portion of the reaction system is operational.

16. The machine of claim 15, where the control system is adapted to test the portion of the reaction system while the motor is running, and to shut off the motor if the control system determines the portion of the reaction system is not operational while the motor is running.

JX-017.

C. Claim Construction

In Order No. 7 I construed the terms “detection system” (claims 1, 5 and 16) and “control system” (claims 1, 5, 10, and 16) to have their plain and ordinary meaning as understood by one of ordinary skill in the art in view of the specification and prosecution history. Order No. 7. In Order No. 11 I determined that the term “reaction system” (claims 1, 5, 10 and 16) is properly construed under 35 U.S.C. § 112, ¶ 6. Order No. 11 at 8-9. The recited function for the “reaction system” is “to disable the cutting tool if the dangerous condition is detected” (claims 1,

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5, and 10), and “to disable the cutting tool when the dangerous condition is detected” (claim 16). (See CIB at 41, 62; RRB at 2.); JX-017.26.

The only remaining claim-construction issue left for this initial determination is the identification of corresponding structure. SawStop argues there are a number of structures described in the specification of the ‘455 patent that are clearly linked to the reaction system’s claimed function of disabling the cutting tool if/when the dangerous condition is detected. (See CIB at 76.) Of these structures, SawStop relies only on the one it refers to as Retraction Embodiment #3 to prove infringement and only on the one it refers to as Braking Embodiment #1 to prove technical prong. Thus, I will confine my analysis to these proposed structures.

1. Reaction Embodiment #3

Bosch raises the same arguments with respect to Retraction Embodiment #3 and the ‘455 patent as it does with regard to the ‘712 patent. In fact, Bosch addresses its arguments with regard to both patents together in the same section of its responsive post-hearing brief. For the same reasons discussed in the context of the ‘712 patent, I reject Bosch’s arguments as they apply to the ‘455 patent and SawStop’s proposed Retraction Embodiment #3. Moreover, as with regard to the ‘712 patent, I find the structural elements involved in retraction are the arbor block, the spring that forces the arbor block to retract, and the fusible member and compound linkage, which releases the stored energy of the spring when the fuse wire is burned. CX-83 at 14:25-15:9, 15:20-23, Figs. 10-12.

Based on the ‘455 patent specification, I find a person skilled in the art would understand that the disclosed safety system can perform different “predetermined actions,” including “retraction of the cutting tool,” and that these actions can be performed either alone or in combination. See JX-017 at 4:17-38. The specification makes clear that these “predetermined actions” take place upon detection of a dangerous condition. The specification goes on to

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explain that “Retraction of the cutting tool from its operating position is described in more detail in U.S. Provisional Patent Application Ser. No. 60/225,089.” *Id.* The ‘089 provisional application, in turn, identifies the embodiment of Figures 10-12 as an exemplary structure for performing the “predetermined action” of “direct retraction.” CX-83 at 14:17-16:10, Figs. 10-12. Reading these passages together, I find a person skilled in the art would understand that the patent specifications clearly link Retraction Embodiment #3 to the function of retraction, which is a predetermined action that takes place to disable the cutting tool if/when the dangerous condition is detected. Tr. at 535:12-537:19.

Accordingly, I find Retraction Embodiment #3 to be structure corresponding to the claimed reaction system’s claimed function of disabling the cutting tool if/when a dangerous condition is detected.

2. Braking Embodiment #1

SawStop argues that Braking Embodiment #1 consists of “the combination of a brake pawl, spring, and fuse wire, and equivalents thereof.” (CIB at 76 (citing the ‘455 patent at 5:57-6:45).) SawStop also argues this structure is clearly linked to the claimed function of disabling the cutting tool if/when a dangerous condition is detected. (CIB at 76.) Bosch agrees with SawStop, stating in its responsive brief that Braking Embodiment #1 (*i.e.*, the combination of brake pawl, spring, and fuse wire) is a structure described in the specification of the ‘455 patent and clearly linked to the claimed “reaction system” elements. (RRB at 3.)

Accordingly, there being no dispute, I find Braking Embodiment #1 to be structure corresponding to the claimed reaction system’s claimed function of disabling the cutting tool if/when a dangerous condition is detected.

PUBLIC VERSION**D. Infringement**

SawStop asserts the Accused Products infringe claims 1, 5, 10, and 16 of the '455 patent. (CIB at 75-85.)

1. Claim 1

SawStop contends the Accused Products infringe claim 1. In support, SawStop adduced a significant amount of testimony at the hearing. *See* Tr. at 339:18-340:21, 400:18-460:16, 460:25-461:10; RPX-2; CX-181C; CX-232C. Bosch raises only two non-infringement arguments. Bosch argues the Accused Products do not infringe the “reaction system” limitation under 35 U.S.C. §112, ¶ 6 and Bosch argues the Accused Products do not infringe the “control system” limitation of the '455 patent.

As set forth in more detail below, I find the Accused Products do not include a “reaction system” as that term has been construed under 35 U.S.C. §112, ¶ 6. Accordingly, I find SawStop has failed to prove by a preponderance of the evidence that the Accused Products infringe claim 1 of the '455 patent.

a. “reaction system”

The parties raise the same arguments with regard to the “reaction system” limitation in claim 1 of the '455 patent as they did with regard to claim 8 of the '712 patent. Thus, for the same reasons set forth above with respect to claim 8 of the '712 patent, I find the Accused Products do not include the reaction system of claim 1 of the '455 patent.

b. “control system”**Parties' Positions**

SawStop argues that the accused products include “a control system configured to determine the operability of the reaction system without having to operate the reaction system and to disable the motor if the reaction system is inoperable.” (CIB at 78.) Specifically,

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SawStop argues the control system in the Accused Products performs two types of tests to ensure the blade-retraction system is functioning properly. (*Id.*) According to SawStop, [

] (*Id.*) SawStop contends that the Accused Products include a microprocessor that

[

] (*Id.*) SawStop

argues that if the processor determines either test has failed, it will disable the motor by

disconnecting it from its power supply. (*Id.* at 78-79.) SawStop argues that its expert,

Dr. Wolfe, testified that the [] meet the claim

requirements of determining the operability of the reaction system without having to operate the reaction system, and disabling the motor if the reaction system is inoperable. (*Id.* at 79.)

Bosch contends the evidence at the hearing demonstrated that it is impossible to test the reaction system to literally tell if it is operable, as is required by claim 1. (RRB at 32.) Bosch alleges that Dr. Wolfe admitted on cross-examination that the REAXX saw does not meet the “control system” limitation of claim 1 of the ’455 patent. (*Id.* at 33.) Bosch argues that by Dr. Wolfe’s own admission, the REAXX saw tests only portions of the reaction system and cannot literally confirm that the system is indeed functional, and thus does not literally infringe this claim. (*Id.*)

Discussion

As explained in more detail below, the evidence shows the Accused Products include “a control system configured to determine the operability of the reaction system without having to

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operate the reaction system and to disable the motor if the reaction system is inoperable.” Tr. at 462:6-464:5. The control system in the Accused Products performs two types of tests to ensure the blade-retraction system is functioning properly. Tr. at 378:19-379:16; CX-183C.3; CX-233C.25. The first test uses a [

] Tr.

at 380:16-381:24, 382:9-384:13; CX-183:10; CX-204C.10. To perform the test, [

] Tr. at 380:16-

381:24, 382:9-384:13; CX-183:10; CX-204C.10. [

] Tr. at 382:9-383:5; CX-224C. [

]

Tr. at 382:9-384:13; CX-183:10; CX-204C.10. The second test [

] Tr. at 378:19-

379:16, 384:14-385:9; CX-183C.3; CX-233C.25. This test [

] Tr. at 384:14-385:9; CX-183C.13.

The evidence shows that the Accused Products include a [

] Tr. at 378:19-

379:19, 380:23-382:8; 385:10-386:20; CX-233C.25; CX-216C at [

]

lines 122-144 and [

] The evidence shows that [

] Tr. at 378:19-379:19, 380:23-382:8; 385:10-386:20; CX-233C.25.

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The above evidence demonstrates that the Accused Products have a control system that tests [] to determine operability of the reaction system. The evidence shows that the Accused Products perform these tests without having to actuate the pyrotechnic cartridge, and therefore without having to operate the reaction system. This is exactly what is recited in claim 1 of the '455 patent. Further, during the evidentiary hearing, Dr. Wolfe convincingly explained why this operation infringes the "control system" limitation of claim 1. Tr. at 462:6-464:5. Accordingly, I find the Accused Products satisfy the "control system" limitation of claim 1 of the '455 patent.

Bosch argues that the Accused Products do not infringe claim 1 of the '455 patent because "the REAXX saw tests only portions of the reaction system and cannot literally confirm that the system is indeed functional." RRB at 33. Bosch did not raise this argument in its prehearing brief, and therefore I find pursuant to my Ground Rule 11.2 that Bosch has waived the argument. *See* Bosch Prehearing Br. at 46.

Regardless, even if Bosch had not waived the argument, I find Bosch's argument not persuasive. Bosch's argument is premised on the notion that claim 1 requires the control system determine whether the reaction system is "literally" operable. Claim 1 includes no such requirement and I find Bosch's attempt to read the word "literally" into the claims improper.

Contrary to Bosch's argument, I do not find Dr. Wolfe admitted on cross-examination that the REAXX saw does not meet the "control system" limitation of claim 1 of the '455 patent. Rather, Dr. Wolfe explained on cross examination that "if you read the specification, what you understand is that what it's really talking about is testing proxies, testing indicators that the system is probably operational. That's what the Bosch saw does as well." Tr. at 509:7-16. It is black letter law that claims are not read in a vacuum, but must be considered in the context of the

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patent specification, *see Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005), and that is exactly what Dr. Wolfe did in concluding that the Accused Products satisfy the “control system” limitation of claim 1 of the ‘455 patent.

2. Claims 5 and 10

Asserted claims 5 and 10 depend from independent claim 1. As such, for the same reasons discussed above with regard to claim 1, I find the Accused Products do not infringe claims 5 and 10 of the ‘455 patent.

3. Claim 16

SawStop contends the Accused Products infringe dependent claim 16. Claim 16 depends from independent claim 14 and dependent claim 15. JX-017.26. Independent claim 14 includes substantially the same limitations as independent claim 1, with the difference being that the “control system” limitation in claim 1 is “configured to determine the operability of the reaction system,” while the “control system” limitation in claim 14 is “adapted to monitor the detection system and control actuation of the reaction system” and “adapted to test at least a portion of the reaction system.” JX-017.26; Tr. at 466:21-461:6.

At the hearing, SawStop adduced a significant amount of evidence in support of its argument that the Accused Products infringe claim 16 of the ‘455 patent. *See* Tr. at 339:18-340:21, 400:18-460:16, 460:25-461:10, 469:9-470:13, 378:19-379:19, 380:23-382:8; 385:10-386:20, 467:11-468:1, 468:2-469:3; RPX-2; CX-181C; CX-232C ; CX-233C.25; CX-216C at [] lines 122-144 and [] Bosch raises only one non-infringement argument. Bosch argues the Accused Products do not infringe the “reaction system” limitation under 35 U.S.C. §112, ¶ 6.

The parties raise the same arguments with regard to the “reaction system” limitation in claim 1 of the ‘455 patent as they did with regard to claim 8 of the ‘712 patent. Thus, for the

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same reasons set forth above with respect to claim 8 of the '712 patent, I find the Accused Products do not include the "reaction system" of claim 1 of the '455 patent. Accordingly, I find SawStop has failed to prove by a preponderance of the evidence that the Accused Products infringe claim 1 of the '455 patent.

E. Domestic Industry – Technical Prong

SawStop argues that the Domestic Industry Products practice dependent claims 5, 10, and 16 of the '455 patent. Claims 5 and 10 depend from independent claim 1. Claim 16 depends from claim 15, which in turn depends from independent claim 14. Bosch did not provide any arguments to the contrary in its post-hearing briefs. Thus, I find pursuant to my Ground Rules that Bosch has waived its right to argue the Domestic Industry Products do not practice the '455 patent.

1. Claim 1

The evidence adduced at the hearing shows the Domestic Industry Products satisfy all the requirements of independent claim 1 of the '455 patent. In particular, the evidence shows the Domestic Industry Products are woodworking machines including a cutting tool in the form of a saw blade. The saw blade is mounted to an arbor that is driven by a motor to spin the saw blade in operation. Tr. at 500:22-501:10, 489:6-14, 247:11-251:19; CPX-1; CX-104; CX-110; CX-144; CX-244. The evidence also shows the Domestic Industry Products include a "detection system" for the same reasons discussed above with respect to claim 8 of the '712 patent. *See* Section V.E.1, *supra*; *see also* Tr. at 500:22-501:10, 478:20-479:13. In addition, the evidence demonstrates the Domestic Industry Products include a "reaction system" for the same reasons discussed above with respect to claim 8 of the '712 patent. *See* Section V.E.1, *supra*; *see also* Tr. at 501:6-23, 490:2-491:17.

The evidence further shows that the Domestic Industry Products include "a control

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system configured to determine the operability of the reaction system without having to operate the reaction system and to disable the motor if the reaction system is inoperable.” Tr. at 501:24-503:9. Specifically, the evidence shows the self-test system in the Domestic Industry Products ensures that the reaction system is functioning properly. Tr. at 284:17-287:17; CX-104.12; CX-142C.16-18. One test the system preforms checks the voltage on the capacitor that is used to discharge current through the fuse wire. Tr. at 285:6-19; CX-142C.16. Software executing on a DSP in the Domestic Industry Products measures the voltage to ensure that it is within normal operating levels. Tr. at 285:6-19; CX-142C.16. Another test the system performs discharges a small amount of current from the capacitor through the fuse wire without burning the fuse wire. Tr. at 285:6-19; CX-142C.18. Software executing on the DSP measures the current to determine whether the fuse wire is broken or not present. Tr. at 285:6-19; CX-142C.18. The evidence shows that if either test fails, the software executing on the DSP will disable the motor until the fuse wire is replaced, for example, by inserting a new brake cartridge into the saw. Tr. at 285:6-287:14; CX-142C.16-18; CX-218C.256-69. The software disables the motor by turning off a relay that connects the motor to a power supply. Tr. at 286:6-287:14; CX-162C.2. The evidence shows that the self-test system in the Accused Products operates prior to turning on the motor and while the motor is running. Tr. at 286:6-287:14; CX-142C.18; CX-218C.159-76. At the hearing, SawStop’s expert, Dr. Wolfe, explained that the bridge-wire and capacitor self-tests in the domestic industry products are configured to determine the operability of the reaction system without having to operate the reaction system. Tr. at 501:24-502:21. He also explained that the control system is configured to disable the motor if either test fails. Tr. at 502:22-503:9.

2. Claim 5

Claim 5 of the ‘455 patent depends from claim 1 and recites, “[t]he machine of claim 1, where the reaction system includes at least one replaceable single-use component, and where the

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control system is configured to detect whether the single-use component has been used, and if so, to disable the motor until the single-use component has been replaced.” The evidence adduced at the hearing demonstrates that the Domestic Industry Products meet this additional requirement. Tr. at 503:10-504:10. Dr. Wolfe explained that the fuse wire and capacitor in the brake cartridge of the Domestic Industry Products are each replaceable single-use components, and the control system is configured to determine whether the fuse wire and capacitor have been used by performing the fuse wire and capacitor self-tests. Tr. at 503:10-504:3, 285:6-287:14; CX-142C.16-18; CX-218C.256-69. The evidence shows that if either test fails, then the DSP in the Domestic Industry Products disables the motor until the brake cartridge—and therefore the fuse wire and capacitor—have been replaced. Tr. at 504:4-10, 285:6-287:14; CX-142C.16-18.

Accordingly, based on the uncontested evidence, I find SawStop has proven by at least a preponderance of the evidence that the Domestic Industry Products practice claim 5 of the ’455 patent.

3. Claim 10

Claim 10 of the ’455 patent depends from claim 1 and recites, “[t]he machine of claim 1, where the reaction system is adapted to be electrically coupled to the control system, and where the control system is configured to disable the motor if the reaction system is not coupled to the control system.” The evidence adduced at the hearing demonstrates the reaction system in the Domestic Industry Products is electrically coupled to the control system through the fuse wire. Tr. at 503:10-504:10; CX-162.3. As described above with respect to claim 1, the control system is configured to determine whether the fuse wire is in tact, and therefore whether the reaction system is connected to the control system. Tr. at 503:10-504:3, 285:6-287:14; CX-142C.16-18; CX-218C.256-69. The evidence shows that if the fuse wire self-test fails, then the DSP disables the motor. Tr. at 504:4-10, 285:6-287:14; CX-142C.16-18.

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Accordingly, based on the uncontested evidence, I find SawStop has shown by at least a preponderance of the evidence that the Domestic Industry Products practice claim 10 of the '455 patent.

4. Claim 16

Claim 16 depends from dependent claim 15, which in turn depends from independent claim 14. JX-017.26. As discussed above with respect to the Accused Products, independent claim 14 includes substantially the same limitations as independent claim 1, with the difference being that the “control system” limitation in claim 1 is “configured to determine the operability of the reaction system,” while the “control system” limitation in claim 14 is “adapted to monitor the detection system and control actuation of the reaction system” and “adapted to test at least a portion of the reaction system.” JX-017.26.

The evidence adduced at the hearing demonstrates that the Domestic Industry Products meet the limitations of claim 14 for the reasons set forth above with respect to claim 1. *See* Section VI.E.1, *supra*; Tr. at 504:11-506:24. SawStop’s expert, Dr. Wolfe, convincingly testified that the control system in the Domestic Industry Products monitors the detection system and controls actuation of the reaction system by monitoring the contact detection system and generating trigger signals to discharge the capacitor into the fuse wire, thereby releasing the brake pawl into the spinning saw blade. Tr. at 505:5-12, 268:13-270:11. Further, the evidence shows the control system tests at least a portion of the reaction system because it performs self-testing on the bridge wire and firing capacitor. Tr. at 501:24-502:21, 285:6-287:14; CX-142C.16-18; CX-218C.256-69.

Claim 15 adds the requirement that the woodworking machine of claim 14 include “a motor controllable by the control system to drive the cutting tool, and where the control system is adapted to test the portion of the reaction system prior to actuation of the motor, and where the

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control system is adapted not to actuate the motor unless the portion of the reaction system is operational.” Claim 16 adds the requirement that “the control system is adapted to test the portion of the reaction system while the motor is running, and to shut off the motor if the control system determines the portion of the reaction system is not operational while the motor is running.” The evidence shows the Domestic Industry Products meet both requirements. Tr. at 505:13-506:24. Specifically, the evidence shows the DSP in the Domestic Industry Products performs the fuse wire and capacitor self-tests prior to turning on the motor and while the motor is running. Tr. at 505:13-506:24, 286:6-287:14; CX-142C.18; CX-218C.159-76. The evidence shows that if either test fails, software executing on the DSP will disable the motor until the fuse wire is replaced, for example, by inserting a new brake cartridge into the saw. Tr. at 505:13-506:24, 285:6-287:14; CX-142C.16-18; CX-218C.256-69.

Accordingly, based on the uncontested evidence, I find SawStop has proven by at least a preponderance of the evidence that the Domestic Industry Products meet every limitation of claim 16 of the ‘455 patent.

VII. U.S. PATENT NO. 7,895,927**A. Level of Ordinary Skill in the Art**

As set forth in Order No. 7, a person of ordinary skill in the art with respect to the ‘927 patent at the time of the invention would have had either an undergraduate degree in mechanical engineering and substantial coursework in electrical engineering, or an undergraduate degree in electrical engineering and substantial coursework in mechanical engineering, plus three to five years of professional experience in mechatronics and familiarity and experience with woodworking machines, including a basic understanding of how the machines operate. *See* Order No. 7 at 5.

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B. Claims-at-Issue

7. A woodworking machine comprising:

a work surface defining a cutting region;

a cutting tool positioned to extend at least partially into the cutting region;

a detection system adapted to detect a dangerous condition between a person and the cutting tool; and

a reaction system associated with the detection system and the cutting tool, where the reaction system is configured to retract the cutting tool below the work surface within approximately 14 milliseconds after the dangerous condition is detected by the detection system.

8. The woodworking machine of claim 7 where the dangerous condition is contact between a person and the cutting tool.

12. The woodworking machine of claim 7, where the reaction system includes an explosive.

JX-019.

C. Claim Construction

In Order No. 7 I construed the terms “detection system” (claim 8) and “reaction system” (claim 8) to have their plain and ordinary meaning as understood by one of ordinary skill in the art in view of the specification and prosecution history. Order No. 7.

D. Infringement

SawStop asserts the Accused Products infringe claims 8 and 12 of the ‘927 patent. (CIB at 82-88.) Claims 8 and 12 each depend from independent claim 7. Respondents did not provide any non-infringement arguments with respect to the ‘927 patent in their post-hearing briefs.

Thus, I find pursuant to my Ground Rules that Bosch has waived its right to argue the Accused Products do not infringe the ‘927 patent.

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At set forth in more detail below, the evidence adduced at the hearing demonstrates that the Accused Products infringe dependent claims 8 and 12 of the '927 patent. *See generally* Tr. at 388:11-392:22.

1. Claim 7

The evidence shows the Accused Products are woodworking machines that include a work surface that defines a region for cutting wood and a cutting tool that extends partially into the cutting region. Tr. at 389:4-21, 339:18-340:21; RPX-2; CX-181C; CX-232C. The evidence also shows the Accused Products include a "detection system" for the same reasons discussed with respect to claim 8 of the '712 patent. *See* Section V.D.1, *supra*; *see also* Tr. at 389:22-390:13, 340:22-341:6, 346:12-348:11.

In addition, the evidence shows the Accused Products include "a reaction system associated with the detection system and the cutting tool, where the reaction system is configured to retract the cutting tool below the work surface within approximately 14 milliseconds after the dangerous condition is detected by the detection system." Tr. at 390:14-392:22. Specifically, the evidence shows the reaction system in the Accused Products is associated with the detection system and the cutting tool because the trigger signal issued by the detection system causes the reaction system to fire and retract the saw blade. Tr. at 390:25-391:16. The trigger signal [

] in CX-183C.13, which then []

Tr. at 350:25-352:24; CX-183C.13. [

] Tr. at 350:25-352:24; CX-

183C.13. [] Tr. at

352:25-354:1; CX-224C. The heat causes a chemical material positioned in the pyrotechnic

cartridge to decompose and release compressed [] which quickly expands within the

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cartridge and forces a piston downward and out of the cartridge. Tr. at 352:25-354:11; CX-224C. In normal operation, the evidence shows the end of the piston is abutting the swing arm that supports the arbor and saw blade. Tr. at 354:2-11; CX-181C.11. However, when a dangerous condition is detected, the evidence shows the [

] and retracting the saw blade under the table and away from the user. Tr. at 354:2-357:13; CX-181C.11; CDX-5.

The evidence shows it takes approximately [] for the pyrotechnic cartridge in the Accused Products to fire and the piston to begin moving after the contact-detection system determines that a dangerous condition exists between a person and the spinning saw blade. Tr. at 357:24-359:8; CX-204C.20. Bosch documents indicate that after the piston starts moving, it takes approximately [] for the saw blade to retract completely below the table surface. Tr. at 359:9-361:4; CX-178C.11; CX-180C.2. Thus, the time it takes for the saw blade to retract below the table after a dangerous condition is detected is approximately [] Tr. at 391:17-392:4, 357:18-23. Bosch's corporate representative, Eric Laliberte testified consistently with these numbers, explaining that the Accused Products retract the saw blade completely below the table surface within [

] after a dangerous condition is detected. Tr. at 361:5-362:1, 725:12-726:17; JX-022C at 68:7-12.

2. Claim 8

Claim 8 depends from claim 7 and recites, "[t]he woodworking machine of claim 7 where the dangerous condition is contact between a person and the cutting tool." As set forth above with respect to claim 8 of the '712 patent, the evidence shows the dangerous condition detected by the detection system of the Accused Products is contact between a person and the saw blade. *See* Section V.D.1, *supra*; *see also* Tr. at 392:5-13, 340:22-341:6, 346:12-348:11.

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Accordingly, based on the uncontested evidence, I find the Accused Products infringe the claim 8 of the '927 patent.

3. Claim 12

Claim 12 depends from claim 7, and recites "[t]he woodworking machine of claim 7, where the reaction system includes an explosive." As set forth above with respect to the "reaction system" limitation of claim 7, the evidence shows the pyrotechnic cartridge in the Accused Products includes a chemical explosive. *See* Section VII.D.1, *supra*; *see also* Tr. at 392:14-22.

Accordingly, based on the uncontested evidence, I find the Accused Products infringe claim 12 of the '927 patent.

E. Domestic Industry – Technical Prong

SawStop asserts the Domestic Industry Products practices dependent claim 8 of the '927 patent. (CIB at 88-90.) Bosch did not provide any arguments to the contrary in its post-hearing briefs. Thus, I find pursuant to my Ground Rules that Bosch has waived its right to argue the Domestic Industry Products do not practice the '927 patent.

1. Claim 7

The evidence adduced at the hearing shows the Domestic Industry Products satisfy all the requirements of independent claim 7 of the '927 patent. In particular, the evidence shows the Domestic Industry Products are woodworking machines that include a work surface that defines a region for cutting wood and a cutting tool that extends partially into the cutting region. Tr. at 478:2-15, 247:11-251:19; CPX-1; CX-104; CX-110; CX-144; CX-244. The evidence also shows the Domestic Industry Products include a "detection system" for the same reasons discussed above with respect to claim 8 of the '712 patent. *See* Section V.D.1, *supra*; *see also*

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Tr. at 478:16-479:13.⁹

In addition, the evidence shows the Domestic Industry Products include “a reaction system associated with the detection system and the cutting tool, where the reaction system is configured to retract the cutting tool below the work surface within approximately 14 milliseconds after the dangerous condition is detected by the detection system.” Tr. at 479:14-481:24. Specifically, the evidence shows the reaction system in the Domestic Industry Products is associated with the detection system and the cutting tool because the fire signal issued by the detection system causes the reaction system to fire and brake the saw blade. Tr. at 479:21-480:2. According to the evidence, the fire signal activates the gate of a silicon-controlled rectifier (SCR) that acts as an electronic switch. Tr. at 269:24-270:11; CX-162C.3. Opening the SCR allows a high-voltage capacitor to rapidly discharge a large amount of charge through a fuse wire in the brake cartridge. Tr. at 269:24-270:11; CX-162C.3. In normal operation of the Domestic Industry Products, the evidence shows the fuse wire holds a spring in compression against an aluminum brake pawl. Tr. at 269:24-272:1; CX-166C; CX-167C. However, when the high-voltage capacitor discharges through the fuse wire, the evidence shows the fuse wire will fail and release the stored energy in the compressed spring pushing the brake pawl against the spinning saw blade, thereby stopping rotation of the blade. Tr. at 269:24-272:1; CPX-7; CX-166C; CX-167C.

The evidence shows the saw blade in the Domestic Industry Products is mounted on an arbor, which in turn is supported by a pivoting arbor block held in position by a latch. CX-104.11; CX-142C.1. When the brake pawl engages the spinning saw blade, the resulting angular

⁹ While portions of this excerpt refer to the ‘712 patent, the record was later clarified to explain that the testimony relates to the ‘927 patent. Tr. at 481:2-12.

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momentum overcomes the force of the latch and causes the blade to retract below the table surface. Tr. at 276:4-281:6; CX-104.11; CX-142C.1. The time it takes from the point at which the contact-detection system determines a dangerous condition exists between a person and the saw blade, and the point at which the saw blade retracts below the table surface is less than 14 milliseconds. Tr. at 480:3-481:24, 276:4-281:6, 480:3-481:24; CDX-11. Specifically, the evidence shows the total retraction time for the JSS is approximately 9.7 milliseconds; the total retraction time for the ICS is approximately 13.1 milliseconds; the total retraction time for the PCS is approximately 12.2 milliseconds; and the total retraction time for the CNS is approximately 13.5 milliseconds. Tr. at 481:15-24. At the hearing Dr. Gass convincingly explained that these times were derived from high-speed videos of the Domestic Industry Products. Tr. at 276:4-281:6; CPX-9; CPX-10; CPX-11; CPX-12; CPX-13; CX-536; CX-538; CX-539; CX-540; CX-541.

2. Claim 8

Claim 8 depends from claim 7 and recites, “[t]he woodworking machine of claim 7 where the dangerous condition is contact between a person and the cutting tool.” As set forth above with respect to claim 8 of the ‘712 patent, the detection algorithms in the Domestic Industry Products detect a dangerous condition resulting from contact between a person and the saw blade. *See* Section V.E.1, *supra*; *see also* Tr. at 481:25-482:6.

Accordingly, based on the uncontested evidence, I find the Domestic Industry Products practice claim 8 of the ‘927 patent.

VIII. U.S. PATENT NO. 8,011,279**A. Level of Ordinary Skill in the Art**

As set forth in Order No. 7, a person of ordinary skill in the art with respect to the ‘279 patent at the time of the invention would have had either an undergraduate degree in mechanical

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engineering and substantial coursework in electrical engineering, or an undergraduate degree in electrical engineering and substantial coursework in mechanical engineering, plus three to five years of professional experience in mechatronics and familiarity and experience with woodworking machines, including a basic understanding of how the machines operate. *See* Order No. 7 at 5.

B. Claims-at-Issue

The following claims of the '279 patent are at-issue in this investigation.

1. A woodworking machine comprising:

a support frame;

a motor supported by the frame;

a cutting tool supported by the frame and moveable by the motor;

a detection system adapted to detect a dangerous condition between a person and the cutting tool;

a mechanism having a moveable component adapted to move upon detection of the dangerous condition by the detection system, where movement of the moveable component contributes to one or more of the following actions to mitigate or prevent injury to the person: deceleration of the cutting tool, and retraction of the cutting tool; and

an actuator having stored energy sufficient to move the moveable component $1/32^{\text{nd}}$ of an inch within approximately 3 milliseconds or less after the dangerous condition is detected.

6. The machine of claim 1, where the actuator is adapted to move the moveable component at an acceleration of over 2000 ft/s.^{sup.2} when the detection system detects the dangerous condition.

16. A woodworking machine comprising:

a support frame;

a motor supported by the frame;

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a cutting tool supported by the frame and moveable by the motor;

a detection system adapted to detect a dangerous condition between a person and the cutting tool;

a mechanism having a moveable component adapted to move upon detection of the dangerous condition by the detection system, where movement of the moveable component contributes to the mitigation or prevention of injury to the person through retraction of the cutting tool; and

an actuator having stored energy sufficient to move the moveable component $1/32^{\text{nd}}$ of an inch within approximately 3 milliseconds or less after the dangerous condition is detected.

17. The machine of claim 16, where the actuator is configured to move the moveable component at an acceleration of 500 ft/sec^2 or more.

C. Claim Construction

In order No. 7, I construed the terms “detection system” and “moveable component” in claims 1 and 16 to have their plain and ordinary meaning as understood by one of ordinary skill in the art in view of the specification and prosecution history. Order No. 7.

D. Infringement

SawStop asserts the Accused Products infringe claims 1, 6, 16, and 17 of the ‘279 patent. (CIB at 91.) Respondents did not provide any non-infringement arguments with respect to the ‘279 patent in their post-hearing briefs. Thus I find pursuant to my Ground Rules that Respondents have waived their right to argue the Accused Products do not infringe the ‘279 patent.

1. Claim 1

The evidence adduced at the evidentiary hearing shows the Accused Products infringe claim 1 of the ‘279 patent.

In particular, the evidence shows the Accused Products are woodworking machines that include a support frame, a motor supported by the frame, and a cutting tool supported by the

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frame and moveable by the motor. Tr. at 393:8-394:2, 339:18-340:21; RPX-2; CX-181C; CX-232C. The evidence also shows the Accused Products include a “detection system” for the same reasons discussed with respect to claim 8 of the ‘712 patent. *See* Section V.D.1, *supra*; *see also* Tr. at 394:3-9, 340:22-341:6, 346:12-348:11.

In addition, the evidence shows the Accused Products include “a mechanism having a moveable component adapted to move upon detection of the dangerous condition by the detection system, where movement of the moveable component contributes to one or more of the following actions to mitigate or prevent injury to the person: deceleration of the cutting tool, and retraction of the cutting tool.” Tr. at 394:10-396:11. Specifically, the mechanism is a swing arm assembly and the moveable component is the swing arm itself that supports an arbor holding the saw blade. Tr. at 394:16-24; CX-181C.11; CX-232C.11. The swing arm moves downward upon detection of human contact with the spinning saw blade in order to retract the saw blade away from the user and thereby prevent or mitigate injury. Tr. at 394:25-396:11; CX-181C.7, 11; CX-232C.11.

Further, the evidence shows the Accused Products include “an actuator having stored energy sufficient to move the moveable component $1/32^{\text{nd}}$ of an inch within approximately 3 milliseconds or less after the dangerous condition is detected.” Tr. at 396:12-397:22. The actuator in the Accused Products consists of the pyrotechnic cartridge, including the piston, the pyrotechnic material, and the bridge wire. Tr. at 396:17-19; CX-181C.11; CX-224C. The evidence shows the actuator has stored chemical energy sufficient to move the swing-arm assembly approximately $1/32^{\text{nd}}$ of an inch—or just under one millimeter—[

] after the detection system detects a dangerous condition, and approximately one inch—or 25 millimeters—[] after the dangerous condition is

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detected. Tr. at 396:20-397:22, 362:15-364:19, 741:14-742:17; CX-204C.20; CX-243C; JX-022C at 68:7-12.

Based on the uncontested evidence set forth above, I find the Accused Products infringe claim 1 of the '279 patent.

2. Claim 6

Claim 6 of the '279 patent depends from claim 1 and includes the additional requirement that the actuator be “adapted to move the moveable component at an acceleration of over 2000 ft/s² when the detection system detects the dangerous condition.” The evidence shows that when the detection system in the Accused Products determines that a dangerous condition exists, the piston in the pyrotechnic cartridge pushes the swing arm downward at an average acceleration of approximately [] Tr. at 397:23-399:13; CDX-8.

Accordingly, based on the uncontested evidence set forth above, I find the Accused Products infringe claim 6 of the '279 patent.

3. Claim 16

Independent claim 16 of the '279 includes substantially the same limitations as independent claim 1, with the difference being that the “moveable component” recited in claim 1 contributes to deceleration or retraction of the cutting tool, while the “moveable component” recited in claim 16 contributes to retraction of the cutting tool only. JX-020.0038-39. The evidence shows the moveable component in the Accused Products contributes to retraction of the cutting tool. Tr. at 399:14-400:6. Thus, for the same reasons set forth with respect to claim 1, I find the Accused Products infringe claim 16 of the '279 patent. *See* Section V.C.1, *supra*.

4. Claim 17

Claim 17 depends from claim 16 and requires the actuator be “configured to move the moveable component at an acceleration of 500 ft/sec² or more.” For the same reasons set forth

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with regard to claim 6, I find the Accused Products meet the requirements of claim 17. *See* Section V.C.2, *supra*; Tr. at 400:7-17.

Accordingly, based on the uncontested evidence, I find the Accused Products infringe claim 17 of the '279 patent.

E. Domestic Industry – Technical Prong

SawStop asserts the Domestic Industry Products practice claims 1, 4, 6, 16, and 17 of the '279 patent. (CIB at 93-96.) Bosch did not provide any arguments to the contrary in their post-hearing briefs. Thus, I find pursuant to my Ground Rules that Bosch has waived its right to argue the Domestic Industry Products do not practice the '279 patent..

1. Claim 1

The evidence adduced at the evidentiary hearing shows the Domestic Products practice claim 1 of the '279 patent. In particular, the evidence shows the Domestic Products are woodworking machines that include a support frame, a motor supported by the frame, and a cutting tool supported by the frame and moveable by the motor. Tr. at 482:7-24, 247:11-251:19; CPX-1; CX-104; CX-110; CX-144; CX-244.

The evidence also shows the Domestic Industry Products include a “detection system” for the same reasons discussed above with respect to claim 8 of the '712 patent. *See* Section V.E.1, *supra*; *see also* Tr. at 482:25-483:4, 478:20-479:13, 500:22-501:10.

In addition, the evidence shows the Domestic Industry Products include “a mechanism having a moveable component adapted to move upon detection of the dangerous condition by the detection system, where movement of the moveable component contributes to one or more of the following actions to mitigate or prevent injury to the person: deceleration of the cutting tool, and retraction of the cutting tool.” Tr. at 483:5-484:4. The mechanism is the brake pawl assembly and the moveable component is the brake pawl itself. Tr. at 483:5-10. When the capacitive

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detection system in the Domestic Industry Products determines that a dangerous condition exists between a user and saw blade, the software turns on two lines that activate the gate of an SCR that acts as an electronic switch. Tr. at 269:24-270:11; CX-162C.3. Opening the SCR allows a high-voltage capacitor to rapidly discharge a large amount of charge through a fuse wire in the brake cartridge. Tr. at 269:24-270:11; CX-162C.3. The evidence shows that in normal operation of the Domestic Industry Products, the fuse wire holds a spring in compression against the brake pawl. Tr. at 269:24-272:1; CX-166C; CX-167C. When the high-voltage capacitor discharges the charge through the fuse wire, the fuse wire fails and releases stored energy in the compressed spring to push the brake pawl against the spinning saw blade, thereby stopping rotation of the blade and retracting it below the work surface in order to mitigate and prevent injury. Tr. at 483:11-484:4, 269:24-272:1; CX-104.11; CX-142C.1.

Further, the evidence shows the Domestic Industry Products include “an actuator having stored energy sufficient to move the moveable component $1/32^{\text{nd}}$ of an inch within approximately 3 milliseconds or less after the dangerous condition is detected.” Tr. at 484:5-485:18. The actuator in the Domestic Industry Products consists of the spring and fuse wire. Tr. at 484:5-9. The evidence shows that the brake pawl travels approximately $1/8^{\text{th}}$ of an inch from its resting position to contact the saw blade and that the time it takes from the point at which the contact-detection system determines a dangerous condition exists between a person and the saw blade, and the point at which the brake pawl engages the saw blade is approximately 1.28 milliseconds. Tr. at 274:11-13; CX-104.21; Tr. at 484:10-485:6. Specifically, the evidence shows it takes approximately 500 nanoseconds for the DSP to generate the signal to burn the fuse wire after the dangerous condition is detected. Tr. at 277:17-278:3. It then takes approximately 20 to 21 microseconds for the signal to turn on the SCR and the high-voltage capacitor to discharge

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current and start burning the fuse wire. Tr. at 278:4-279:11; CPX-13; CX-536. It then takes approximately 1.26 milliseconds for the brake pawl to travel the 1/8th-inch distance to engage the saw blade. Tr. at 273:7-275:22; CPX-7; CX-537. Accordingly, the evidence shows the total time is approximately 1.28 milliseconds. Tr. at 484:5-485:18. Dr. Gass testified that these values were determined by analyzing high-speed videos of the brake pawl engaging the saw blade. Tr. at 273:7-279:11; CPX-7; CPX-13.

Based on the uncontested evidence set forth above, I find the Domestic Industry Products practice claim 1 of the '279 patent.

2. Claim 4

Claim 4 of the '279 patent depends from claim 2. Claim 2 recites, "[t]he machine of claim 1, where the actuator includes one or more springs," and claim 4 recites, "[t]he machine of claim 2, where the one or more springs are adapted to apply at least 100 lbs. of force to move the moveable component." The evidence adduced at the hearing shows the spring used in the Domestic Industry Products applies approximately 150 pounds of force to the brake pawl. Tr. at 272:2-11, 485:19-486:19.

Accordingly, based on the uncontested evidence, I find the Domestic Industry Products practice claim 4 of the '279 patent.

3. Claim 6

Claim 6 of the '279 patent depends from claim 1, and recites "[t]he machine of claim 1, where the actuator is adapted to move the moveable component at an acceleration of over 2000 ft/s² when the detection system detects the dangerous condition." The evidence shows that when the detection system in the Domestic Industry Products determines that a dangerous condition exists, the spring pushes the brake pawl towards the spinning saw blade at an average acceleration of approximately 13,000 ft/s². Tr. at 486:20-488:8; CDX-13.

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Accordingly, based in the uncontested evidence I find the Domestic Industry Products practice claim 6 of the '279 patent.

4. Claim 16

Independent claim 16 of the '279 patent includes substantially the same limitations as independent claim 1, with the difference being that the "moveable component" recited in claim 1 contributes to deceleration or retraction of the cutting tool, while the "moveable component" recited in claim 16 contributes to retraction of the cutting tool only. JX-020.0038-39. I find the uncontested evidence shows the Domestic Industry Products meet the requirements of claim 16 for the same reasons set forth above with respect to claim 1. *See* Section VIII.E.1, *supra*; Tr. at 488:9-23.

Accordingly, I find the Domestic Industry Products practice claim 16 of the '279 patent.

5. Claim 17

Claim 17 depends from claim 16 and recites, "where the actuator is configured to move the moveable component at an acceleration of 500 ft/sec² or more." I find the uncontested evidence shows the Domestic Industry Products meet the requirements of claim 17 for the same reasons set forth above with respect to claim 6. *See* Section VIII.E.3, *supra*; Tr. at 488:24-489:5.

Accordingly, I find the Domestic Industry Products practice claim 17 of the '279 patent.

IX. INDIRECT INFRINGEMENT

SawStop argues that Bosch contributes to infringement by selling to end users Activation Cartridge(s) and directing these users to incorporate such Activation Cartridges (and, more particular, a single shot cylinder of such Activation Cartridge) into the Accused Products in a manner that directly infringes the asserted claims. Bosch's sole basis for contesting indirect infringement is that "the accused products do not directly infringe." RRB at 33. Bosch does not dispute any of the additional elements of indirect infringement. (*Id.*)

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Contributory infringement is premised upon a finding that: (1) Respondents sell, offer to sell, or import into the United States a component of a product; (2) the component has no substantial non-infringing use; (3) the component constitutes a material part of the claimed invention; (4) Respondents were aware of the patent and know that the product may be covered by a claim of the patent; and (5) the use of the component in the product directly infringes the claim. *See Certain Gaming & Entm't Consoles, Related Software, & Components Thereof*, Inv. No. 337-TA-752, Final Initial Remand Determination at 8 (Mar. 22, 2013). Each of these requirements is met in this Investigation.

Here, there is no dispute that Respondents sell, offer to sell or import into the United States Activation Cartridges for use with the Accused Products, and that these Activation are designed for, and can only be used with, the Accused Products. JX-022C at 107:2-20, 164:14-16, 165:16-25, 168:9-18; CX-232C.1-49. These Activation Cartridges also constitute a material part of the claimed invention(s), as they are a necessary part of the reaction system (or safety system) recited in each such asserted claim. *See, e.g.*, Tr. at 462:13-464:5 (describing that the motor cannot be supplied power if the cartridge is determined to not be installed); JX-022C at 53:7-54:1. The function of the Activation Cartridge is integral to the claimed reaction system (and safety system) and the operation of the Accused Products—namely, they are necessary for retracting the saw blade in response to detection of a dangerous condition (e.g., human contact with the blade). JX-022C at 52:15-53:6. And the Activation Cartridge has no use other than in the Accused Products. JX-022C at 107:14-22.

There can be no dispute that Respondents were aware of the Asserted Patents well before the filing of the Complaint in the present Investigation. Both Peter Domeny and Eric Laliberte testified that Bosch has analyzed SawStop's patents, and documents from the Joint Venture of

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power tool manufactures, of which Bosch was a member, demonstrate that the group has developed the Accused Products with full knowledge of SawStop's patents for years. CX-246C.9-11; CX-249C.1; CX-250C.1-2; JX-022C at 31:7-20. Bosch's acknowledgement of infringement in response to at least certain asserted claims of the Asserted Patents (in relation to Complainants' motion for summary determination of infringement), such as the asserted claims of the '928 and '279 patents, establishes that Respondents were aware that the Accused Products could infringe one or more asserted claim of the Asserted Patents.

As discussed above, I find SawStop has established each of the elements of a claim for contributory infringement by the Bosch activation cartridge. Accordingly, having previously found the Accused Products direct infringement of the '927 and '279 patents, I find SawStop has also proven by a preponderance of the evidence that the '927 and '279 patents are contributorily infringed. Because I have found herein that the '712 and '455 patents are not infringed, there can be no finding of contributory infringement. It is well settled that "[a]bsent direct infringement of the patent claims, there can be neither contributory infringement ... nor inducement of infringement." *Met-Coil Sys. Corp. v. Korner's Unltd., Inc.*, 803 F.2d 684, 687 (Fed.Cir.1986) (citations omitted).

X. VALIDITY¹⁰

A. Improper Functional Claiming

The Parties' Positions

Bosch argues that "[o]ther than pursuant to §112, ¶ 6, purely functional claiming is improper and not permitted in the United States patent system." (RIB at 7.) Bosch contends that

¹⁰ Ground Rule 15.1.1 states in relevant part, "The post-hearing briefs shall be organized in accordance with the sample outline attached hereto as Appendix B." (*See* Order No. 2.) Bosch ignored this ground rule. As a consequence, and to better conform to the parties' briefs, I will address validity in the same manner in which Bosch addresses it in its initial post-hearing brief.

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I construed certain elements of the asserted and domestic-industry claims as means-plus-function elements, but that I twice found the applicant had not invoked means-plus-function protection with respect to other elements. (*Id.* at 8.) Bosch asserts that neither Complainants nor I have identified any structural restrictions on these non-means-plus-function elements. (*Id.*) Bosch contends that SawStop’s asserted claims could be held invalid for functional claiming under any or all of several labels: federal common law, indefiniteness, written description, and enablement, but that the best basis for a functional-claiming invalidity holding is the patentable-subject-matter requirement of 35 U.S.C. §101. (*Id.* at 10.)

Bosch argues that SawStop’s claimed system elements are similarly purely functional and structurally generic as those presented in *Alice*. (*Id.* at 11.) Bosch states that one of the concerns expressed in *Alice* is that allowing patent applicants to claim abstract ideas “might tend to impede innovation more than it would tend to promote it, thereby thwarting the primary object of the patent laws.” (*Id.*) Bosch contends that this would be exactly the effect of the SawStop patent claims asserted in this Investigation, were they not held to be invalid, because “if these claims are valid, they will, until their expiration, prevent others from building woodworking-tool safety systems using design and technologies they developed themselves—even designs and technologies yet to be invented—no matter how different they might be from the system that SawStop invented.” (*Id.*) Bosch argues that the Section 101 problem with the patent claims SawStop chose to assert is that those claims are directed to the idea of a woodworking machine that can detect a dangerous condition and react to it, not to a particular implementation of that idea. And “an idea itself is not patentable.” (*Id.*)

SawStop argues that Bosch’s functional claiming defense was mooted by Order No. 11, which found all of the allegedly “functional” claims to be either means-plus function claims

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under Section 112, paragraph 6 or to recite structure (thereby rendering these claims non-functional). (CRB at 8.) SawStop contends that because I have already determined that there are no purely functional claims, Respondents' argument here is with my claim construction, which is inappropriate at this stage. (*Id.*)

SawStop argues that there is no "functional claiming" defense in Federal Common Law. (*Id.* at 9.) SawStop argues that in each of the cases cited by Bosch (*Morse*, *Halliburton*, and *Markem*), functional claiming is analyzed within the confines of the written description, enablement, and definiteness requirements. (*Id.* at 10.) SawStop further points out that in one of the cases cited by Bosch, *Markem-Imaje Corp. v. Zipher Ltd.*, the court expressly rejected an argument that functional language not subject to § 112 ¶ 6 renders a claim *per se* invalid, stating "I am unpersuaded by Markem's categorical approach, however, because it is inconsistent with Federal Circuit precedent, which plainly sanctions functional claiming, whether or not at the point of novelty, outside of the framework of a means-plus-function claim." (*Id.* at 10 (citing *Markem-Imaje Corp. v. Zipher Ltd.*, 2012 WL 3263517, at *7 (D.N.H. August 9, 2012).)

SawStop argues that Bosch's attempt to apply the Supreme Court's decision in *Alice Corp.* to its "purely functional" claims theory finds no support in *Alice* or the statutory language of Section 101. (*Id.* at 11.) SawStop argues that the claims at issue in this investigation are all directed to "woodworking machines," which fall within one of the four statutory categories of invention. (*Id.*) SawStop argues that the claimed woodworking machines are not "abstract concepts" as Bosch contends, nor do they cover the mere idea of a woodworking machine that "can detect a dangerous condition and react to it." (*Id.* at 12.) SawStop argues that each asserted claim recites a "woodworking machine" comprised of a specific, ordered combination of elements. (*Id.*) SawStop contends the "detection system" and "reaction system" limitations of

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the asserted claims are completely different than the generic computer hardware at issue in *Alice*. (*Id.*) SawStop argues the “detection system” and “reaction system” elements of the asserted claims are not simply a generic vehicle for implementing the claimed invention, but that they are integral elements of the invention that, together with the other recited claim elements, form new, novel, concrete, and tangible woodworking machines. (*Id.* at 12-13.) SawStop further argues that contrary to Bosch’s argument the asserted claims make clear that they do no preempt all woodworking machine safety systems, or even those that include “detection systems” and “reaction system.” (*Id.* at 13.)

Discussion

This section of Bosch’s brief is troubling. The section appears to be nothing more than an improper attempt by Bosch to revisit my claim construction orders. To the extent Bosch is asking for reconsideration of Order No. 7 or Order No. 11, Bosch’s request is **Denied**. To the extent Bosch is trying to make a substantive argument in its post-hearing brief for me to adjudicate I find Bosch plainly failed to develop any of its arguments sufficiently to preserve them for review and certainly not sufficiently to constitute clear and convincing evidence.

Bosch argues that “Other than pursuant to §112, ¶ 6, purely functional claiming is improper and not permitted in the United States patent system.” In support, Bosch provides the following string cite: “*See, e.g., Halliburton v. Walker*, 329 U.S. 1 (1946); *O’Reilly v. Morse*, 56 U.S. 62 (1853); *Markem-Imaje Corp. v. Zipher Ltd.*, No. 07-cv-6, 2012 WL 3263517 (D.N.H. August 9, 2012); *Ex parte Miyazaki*, 89 U.S.P.Q.2d 1207, 2008 WL 5105055 (B.P.A.I. 2008) (precedential); 35 U.S.C. §§ 101 and 112; *see also, e.g., Alice Corp. v. CLS Bank*, 134 S.Ct. 2347 (2014); *In re Donaldson Co., Inc.*, 16 F.3d 1189 (Fed. Cir. 1994); Patent Act of 1952, ch. 950, §112, 66 Stat. 792, 798–99 (1952).” Bosch provides only general case citations. (*See Ground*

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Rule 15.1.1 (“The post-hearing briefs shall not incorporate anything by reference, but may include pinpoint citations to legal authority or the evidentiary record. “).) Bosch does not provide any pinpoint citations to these cases. Moreover, with the exception of a couple of sentences directed generally to *Alice*, Bosch provides no explanation of the relevancy of any of these cases or how the facts in this investigation relate to them. Bosch contends that Section 101 provides the best basis to invalidate SawStop’s claims, but Bosch fails to provide any particularized analysis under the two-prong test set forth in *Alice*.¹¹ Bosch resorts only to attorney argument and conclusory statements to conclude SawStop’s inventions are abstract. (See e.g., RIB at 11 (“In this Investigation, SawStop’s claimed system elements are similarly purely functional and structurally generic.”).) It is Bosch’s burden to explain the relevancy of the cases it cites and how they advance Bosch’s invalidity arguments. It is not the function of the ALJ to divine Bosch’s arguments. Bosch has the burden to prove patent invalidity and to do so by clear and convincing evidence. Bosch has plainly failed to meet that burden.

¹¹ Bosch argues in its reply brief that the Federal Circuit’s opinion in *Vehicle Intelligence and Safety LLC v. Mercedes-Benz USA, LLC*, 635 Fed.Appx. 914 (Fed. Cir. 2015) supports its argument that all the asserted claims are invalid under Section 101. Bosch never cited, nor discussed, this case in its initial brief even though it was clearly available to Bosch. Yet, in its reply brief, Bosch relies on it as primary support for its Section 101 argument. Notably, Bosch’s discussion of this case and its alleged applicability to the asserted claims spans five pages of Bosch’s reply brief. (See RReplyB at 22-27.) I find Bosch’s discussion of *Vehicle Intelligence* improper reply. By raising new caselaw in reply, Bosch deprives SawStop any opportunity to address its argument, thereby prejudicing SawStop. If Bosch wanted to preserve this argument, Bosch should have included the discussion in its initial brief.

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B. 35 U.S.C. § 112 ¶ 1

- 1. Are the Asserted Claims of the '455, '927 and '279 Patents Invalid for Insufficient Written Description and Lack of Enablement for Failure to Disclose in the Specification any Teaching of an Optical or Ultrasonic Detection System, Among Others?**

The Parties' Positions

Bosch asserts that it is undisputed that the “detection system” limitations in the asserted claims of the '455, '927 and '279 patents, as construed, are broadly directed to genus claims that would cover the use of any species of system to detect a dangerous condition between a person and a cutting tool (such as proximity or contact). (RIB at 16.) Bosch notes that the '455, '927 and '279 patents themselves specifically mention three possible detection systems (capacitive, optical, and resistive), but that there are “countless other types of detection systems that might be considered for this task.” (*Id.*) Bosch argues that despite the broad scope of the claims, vis. a. vis. the “detection system,” the specifications of the '455, '927, and '279 patents teach only a single species of that system, one that relies on capacitive contact sensors. (*Id.* at 17.) Bosch contends the specifications do not describe, for example, optical detection systems. (*Id.*)

Bosch argues there is less disclosure in the '455, '927 and '279 patents than in the insufficient disclosure in *Auto. Techs.* (*Id.*) Bosch argues that like in *Auto Techs.*, here the inventor, Dr. Gass, also did not believe such systems would work. (*Id.* at 18.) Bosch argues that in fact, Dr. Dubowsky testified such systems would not work. (*Id.*) Bosch also asserts that Dr. Gas admitted that he did not possess the details of how to make such systems. (*Id.* at 19.) Bosch argues that in view of these facts, it simply is not possible that the disclosure in the specification could convince a person of skill in the art that the inventor possessed the invention and to enable such a person to make and use the invention without undue experimentation. (*Id.*) Bosch argues the same is true for other covered, but not described, detection systems, including

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ultrasonic systems. (*Id.*) Bosch argues that the lack of disclosure is compounded by the fact that none of the asserted claims are limited to table saws. (*Id.* at 20.)

SawStop argues that Bosch has failed to prove by clear and convincing evidence that a person of ordinary skill in the art would not have been able to practice the claimed invention using an optical sensor “to detect a dangerous condition between a person and a cutting tool” as recited in the “detection system” limitations of the ‘455, ‘927, and ‘279 patents without undue experimentation. (CRB at 15.) SawStop contends Bosch’s argument rests on a misapplication of the law. (*Id.*) SawStop argues that Bosch’s reliance on *Auto. Techs.* for the proposition that the enablement analysis should be limited to the patent disclosure is misplaced. (*Id.*) SawStop argues that unlike in *Auto. Techs.*, the “detection system” limitation is not a novel aspect of the inventions disclosed in the ‘455, ‘927, and ‘279 patents and therefore the enablement inquiry is not limited to the patent disclosure. (*Id.* at 16.) SawStop contends Bosch has consistently argued that the “detection system” limitation was not novel at the time of Dr. Gass’s inventions and that “detection systems,” including optical sensors, were known in the art. (*Id.*)

SawStop argues that when the knowledge of persons skilled in the art and the state of the art are taken into account, it is clear that Bosch has not demonstrated that the use of optical sensors would require undue experimentation. SawStop asserts that during the evidentiary hearing, Bosch’s expert Dr. Dubowsky presented prior art that disclosed the use of optical sensors for detecting a dangerous condition between a person and a band saw blade. (*Id.*) SawStop argues the Hogsholm reference demonstrates conclusively that the use of optical sensors to detect a dangerous condition between a person and a cutting tool was known in the prior art at the time of the invention. (*Id.* at 17.) SawStop also contends that for purposes of his obviousness analysis, Dr. Dubowsky argued that an optical detection system would have been an

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obvious design choice. (*Id.*) Relying on the Federal Circuit’s opinion in *Epistar Corp. v. U.S. Int’l Trade Comm’n*, SawStop argues that because optical sensors were known in the art, the Asserted Patent specifications do not have to provide additional detail concerning their operation in order to satisfy the enablement requirement. (*Id.*)

SawStop argues that in light of the Hogsholm reference and the knowledge of persons skilled in the art, Bosch has plainly failed to meet its burden of proof by clear and convincing evidence that the use of optical sensors would require undue experimentation. (*Id.* at 18.) SawStop contends that aside from case law citations, Bosch’s brief does not use the phrase “undue experimentation,” much less identify specific evidence to explain why, allegedly, undue experimentation would be required to use an optical sensor in connection with the claimed invention. (*Id.*) SawStop argues that likewise, Dr. Dubowsky provided no testimony concerning “undue experimentation,” or otherwise explained why, allegedly, the amount of experimentation necessary to implement use an optical sensor to “detect a dangerous condition between a person and a cutting tool” would have been unduly excessive as required for a finding on non-enablement. (*Id.*) SawStop contends neither of the two excerpts of Dr. Dubowsky’s testimony concerning optical sensors relied on by Bosch amounts to clear and convincing evidence of such undue experimentation (or non-enablement, more broadly). (*Id.*) SawStop argues the testimony is entirely conclusory and therefore insufficient to meet Bosch’s clear and convincing evidence standard. (*Id.*)

With regard to Bosch’s contention that optical sensors would be susceptible to dust in a woodworking environment, SawStop argues that at most, this testimony shows that optical sensors would not be a commercially ideal solution, or even a commercially viable one. (*Id.* at 19.) SawStop argues that regardless, the testimony is hardly clear and convincing evidence that

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a person of ordinary skill in the art would have had to undergo undue experimentation to use optical sensors at all in practicing the invention. (*Id.*) SawStop argues that the claims are not directed to detecting a dangerous condition in a dusty environment, and therefore they do not need to be enabled for that specific situation, but that in any event, Dr. Dubowsky admitted that an optical sensor *would* work in a dusty environment. (*Id.*)

With regard to Bosch's argument that the specifications of the '455, '927, and '279 patents fail to enable the use of a variety of other sensors, including "ultrasonic; doppler radar; optical (active IR) such as differential absorptions or volumetric backscatter; thermal (passive IR); capacitance to ground; e-field tomography; inductive; x-ray fluorescence; and magnetic resonance," SawStop argues that Bosch has failed to meet its burden with respect to these types of sensors. (*Id.* at 20.) SawStop argues that, as with its optical sensor argument, Bosch improperly limits the enablement inquiry to the disclosure of the patents, ignoring the knowledge of a person having ordinary skill in the art. (*Id.*) SawStop argues that the "detection system" limitation is not a novel aspect of the claimed invention, and therefore the enablement inquiry must look beyond the patent specification and consider the knowledge of persons skilled in the art at the time of the invention. (*Id.*) SawStop also argues that Bosch does not cite a single piece of evidence to show that it would have required undue experimentation for a person of skill in the art to use any of the identified sensors in connection with the claimed woodworking machines. (*Id.* at 20-21.) SawStop contends that Bosch relies on a D2M design proposal that lists these sensors among those "reviewed" during its development of active injury mitigation technology, but argues the proposal does not describe the level of experimentation—routine, undue, or otherwise—that would be required to use the sensors to detect a dangerous condition in a woodworking machine. (*Id.* at 21.) SawStop asserts Bosch did not ask Dr. Dubowsky any

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questions about the D2M document and that Dr. Dubowsky did not provide any testimony about these other types of sensors Bosch now alleges “might be considered for this task.” (*Id.*) SawStop argues that Bosch offers no evidence, let alone clear and convincing evidence, sufficient to meet its burden of proof. (*Id.*) SawStop argues that the fact that Dr. Gass considered and rejected “ultrasonic” sensors does not mean the claims lack enablement. (*Id.*) SawStop argues that if an ultrasonic sensor is incapable of performing the claimed function—as Bosch states in its brief—then it falls outside the scope of the claims and need not be enabled. (*Id.*) SawStop argues that Bosch seems to suggest that Dr. Gass should have drafted his claims to specifically exclude ultrasonic sensors, but this is not what the law requires. (*Id.*) SawStop argues that under the law, Bosch is required to demonstrate that ultrasonic sensors are within the scope of the claimed invention but could not have been implemented without undue experimentation and that Bosch has failed on both accounts.

With respect to Bosch’s lack of written description argument, SawStop argues the law is clear that written description and enablement are distinct requirements. (CRB at 26.) SawStop argues that Bosch simply has not presented clear and convincing evidence to show that a person of ordinary skill in the art at the time of the invention would read the disclosures of the ‘455, ‘927, and ‘279 patents and conclude that Dr. Gass was not in possession of the claimed inventions. (*Id.*) SawStop asserts the only testimony Bosch cites from Dr. Dubowsky relates to whether the specification includes an “instruction on how to build an optical detection system” and that this testimony goes to the question of enablement, not written description. (*Id.* at 26-27.) SawStop asserts that Dr. Dubowsky did not provide any testimony about whether the specification describes the invention. (*Id.*) SawStop contends Bosch cites testimony from Dr. Gass to allege “he did not possess” a physical embodiment of his invention that used an optical

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sensor, but SawStop argues physical possession is irrelevant to the written description analysis. (*Id.*) SawStop argues that “what is important is disclosure of the invention, and Dr. Gass plainly met this requirement by identifying the use of optical sensors (a known type of sensor to one of skill in the art) in his specification.” (*Id.*)

Discussion

Title 35 U.S.C. § 112, ¶ 1 sets forth the requirements for enablement and written description:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same.

35 U.S.C. § 112, ¶ 1. Written description and enablement are distinct requirements. *Ariad Pharm., Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1344 (Fed. Cir. 2010) (*en banc*); *see also Allergan, Inc. v. Sandoz Inc.*, 796 F.3d 1293, 1307-08 (Fed. Cir. 2015) (“[T]his statutory language mandates satisfaction of two separate and independent requirements: an applicant must both describe the claimed invention adequately and enable its production and use.”). The written description requirement focuses on whether the patent disclosure describes the claimed invention, while the enablement requirement focuses on whether undue experimentation is necessary to make and use it. *Ariad*, 598 F.3d at 1345.

Bosch co-mingles its enablement and written description arguments in its brief. While I find nothing *per se* wrong with that, as discussed above the inquiry into enablement and written description is distinct. Therefore, I will address each issue separately.

a. Enablement

Invalidity based on lack of enablement is a question of law based on underlying factual findings. *Alcon*, 745 F.3d at 1188. “To prove that a claim is invalid for lack of enablement, a

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challenger must show by clear and convincing evidence that a person of ordinary skill in the art would not be able to practice the claimed invention without undue experimentation.” *Allergan*, 796 F.3d at 1309 (internal quotations omitted).

Bosch argues that every claim from three of the four Asserted Patents should be found invalid for lack of enablement because the “detection system” limitation in these claims covers a wide variety of sensors, but the specification enables only a single embodiment. (See RIB at 16-20.) Specifically, Bosch makes two arguments -- one regarding optical sensors and a second regarding the use of a variety of other sensors. For the reasons discussed in more detail below, I find Bosch has failed to meet its burden to prove by clear and convincing evidence that the asserted claims of the ‘455, ‘927, and ‘279 patents are invalid for lack of enablement.

Bosch’s first argument focuses on optical sensors, which are an embodiment of the “detection system” disclosed in the patent specification. See JX-17 at 5:14–24; JX-019 at 9:19–29; JX-020 at 5:31–41. To prevail on this argument, Bosch must show by clear and convincing evidence that a person of ordinary skill in the art would not have been able to practice the claimed invention using an optical sensor “to detect a dangerous condition between a person and a cutting tool” as recited in the “detection system” limitations of the ‘455, ‘927, and ‘279 patents without undue experimentation. In support of its argument, Bosch relies on the following testimony from its expert, Dr. Dubowsky.

Q: To one of ordinary skill in the art reading the SawStop patents, is there any instruction on how to build an optical system that would discriminate between the wood you’re supposed to be cutting and something like flesh that you’re not supposed to be cutting?

[Dr. Dubowsky]: No.

Tr. at 57:13–22.

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Q: And I think you also indicated that it wouldn't be a preference of how to design a detection system for use in a woodworking machine?

[Dr. Dubowsky]: It probably wouldn't even work. An optical system would be very, very difficult to work, to make work for a woodworking machine;

Tr. at 123:19–24. Bosch also relies on the following testimony from Dr. Gass, inventor of the asserted patents.

[Dr. Gass]: The optical system, I can't say for sure that I did this at that time, but I -- the -- I know that the -- one of the problems you have if you're detecting contact on the top and looking for the teeth to come around with blood on them is that you lose an awful lot of time in transit for the teeth from, you know -- as the teeth come out of the table at the back and then they rotate over to the front, if you make contact at the back, it might be a third of a revolution before you get to the front. . . . So I've potentially lost half of my available stopping time before I can even start to respond if I do an optical system that, you know, can only detect the, the blood beneath the table. So that didn't seem like a -- didn't seem like a great option. I also think -- considered at the time that that would be -- trying to deal with the dust. You know, you're in a very dusty environment, and an optical sensor in a dusty environment is potentially problematic. . . . ;

JX-021C at 20:11–21:15; *see also* 18:12–16.

Q: So in 2001, Dr. Gass, at the time that you filed your utility patent applications, did you know how to build an optical detection system that would discriminate hand from wood?

[Dr. Gass]: I think I certainly could have, yes. I don't -- when you say "know how to," had I collected all the details and, you know, knew the schematics I would use to do that, probably not. But certainly could have. The technology to do that was sort of readily available.

Tr. at 611:11–19. The above testimony represents the sum total of evidence presented by Bosch in support of its non-enablement argument.

The testimony from Dr. Dubowsky, while probative of the issue of enablement, falls way short of the clear and convincing evidence needed to find the asserted claims of the '455, '927, and '279 patents invalid under 35 U.S.C. § 112 ¶ 1. The first passage cited by Bosch focuses on

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whether there is any instruction in the specification on how to build an optical system that would discriminate between wood and flesh. But this question improperly disregards the knowledge of persons skilled in the art. *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1382 (Fed. Cir. 1999) (“Paragraph 1 permits resort to material outside of the specification in order to satisfy the enablement portion of the statute because it makes no sense to encumber the specification of a patent with all the knowledge of the past concerning how to make and use the claimed invention. One skilled in the art knows how to make and use a bolt, a wheel, a gear, a transistor, or a known chemical starting material. The specification would be of enormous and unnecessary length if one had to literally reinvent and describe the wheel.”). As the Federal Circuit stated in *LizardTech, Inc. v. Earth Res. Mapping, Inc.*:

A claim will not be invalidated on section 112 grounds simply because the embodiments of the specification do not contain examples explicitly covering the full scope of the claim language. *See Union Oil Co. v. Atl. Richfield Co.*, 208 F.3d 989, 997 (Fed.Cir.2000). That is because the patent specification is written for a person of skill in the art, and such a person comes to the patent with the knowledge of what has come before. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed.Cir.1995). Placed in that context, it is unnecessary to spell out every detail of the invention in the specification; only enough must be included to convince a person of skill in the art that the inventor possessed the invention and to enable such a person to make and use the invention without undue experimentation.

424 F.3d 1336, 1345 (Fed. Cir. 2005); *see also Nat. Recovery Techs., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1196 (Fed. Cir. 1999) (“The scope of enablement, in turn, is that which is disclosed in the specification plus the scope of what would be known to one of ordinary skill in the art without undue experimentation.”). During the evidentiary hearing, Bosch’s expert Dr. Dubowsky presented prior art that disclosed the use of optical sensors for detecting a dangerous condition between a person and a band saw blade. Tr. at 52:18-53:25;

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RX-013(Hogsholm). Indeed, for purposes of his obviousness analysis, Dr. Dubowsky argued that an optical detection system would have been an obvious design choice. Tr. at 123:1-6.

Because the evidence suggests optical sensors were already known in the prior art for detecting a dangerous condition between a person and cutting tool, the asserted patents did not need to provide additional disclosure to explain how these sensors would be used in order to meet the enablement requirement. Dr. Dubowsky's testimony focuses only on the specifications and fails to consider the knowledge of one of ordinary skill in the art. I therefore find Dr. Dubowsky's testimony to have little probative value.

In the second passage cited by Bosch, Dr. Dubowsky testified that an optical system probably would not work, or at the very least that it would be very difficult to make work for a woodworking machine. This testimony, however, is contradicted by the prior art Hogsholm reference that Dr. Dubowsky testified disclosed the use of optical sensors for detecting a dangerous condition between a person and a band saw blade. The cited testimony is also contradicted by Dr. Dubowsky's testimony that using an optical sensor would be a known "design choice." Moreover, the testimony is entirely conclusory. *See Cephalon*, 703 F.3d at 1338 ("Watson's evidence on enablement was based heavily on Dr. Mumper's testimony. ... Dr. Mumper's *ipse dixit*, statements that co-administration would be 'difficult' and 'complicated,' however, cannot be enough to constitute clear and convincing evidence."); *Koito*, 381 F.3d at 1156. I therefore give Dr. Dubowsky's testimony little weight.

With regard to the testimony of Dr. Gass, I note that he is the inventor of the asserted patents and not one of ordinary skill in the art. Because Dr. Gass is not one of ordinary skill in the art, his testimony is of little to no help to me in deciding whether a person of ordinary skill in the art would have been able to practice the claimed invention using an optical sensor "to detect

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a dangerous condition between a person and a cutting tool” without undue experimentation. I, therefore, give his testimony little weight. Moreover, even if I were to fully credit Dr. Gass’s testimony, I do not find his testimony supports Bosch’s non-enablement position. The first cited passage at best shows optical sensors would not be a commercially ideal solution, or even a commercially viable one, but “Title 35 does not require that a patent disclosure enable one of ordinary skill in the art to make and use a perfected, commercially viable embodiment absent a claim limitation to that effect.” *CFMT, Inc. v. Yieldup Int’l Corp.*, 349 F.3d 1333, 1338 (Fed. Cir. 2003). In the second cited passage Dr. Gass explicitly testified that the optical sensor technology he would employ “was sort of readily available” suggesting that one of ordinary skill in the art would be familiar with optical sensors.

In the end, Bosch’s brief never identifies any specific evidence to explain why, allegedly, undue experimentation would be required to use an optical sensor in connection with the claimed invention. (*See generally* RIB at 16-20.) Likewise, Dr. Dubowsky provided no testimony concerning “undue experimentation,” or otherwise explained why, allegedly, the amount of experimentation necessary to use an optical sensor to “detect a dangerous condition between a person and a cutting tool” would have been unduly excessive as required for a finding on non-enablement. *See Liquid Dynamics Corp. v. Vaughan Co., Inc.*, 449 F. 3d 1209, 1224 (Fed. Cir. 2006). Neither Dr. Dubowsky’s testimony nor Dr. Gass’s testimony amounts to clear and convincing evidence of such undue experimentation (or even non-enablement, more broadly). Accordingly, with regard to optical sensors, I find Bosch has failed to prove by clear and convincing evidence lack of enablement.

Bosch’s second argument focuses on the use of a variety of other sensors, including “ultrasonic; doppler radar; optical (active IR) such as differential absorptions or volumetric

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backscatter; thermal (passive IR); capacitance to ground; e-field tomography; inductive; x-ray fluorescence; and magnetic resonance.”¹² (RIB at 16-17.) Unlike the optical sensor discussed above, none of these types of sensors are explicitly called out in the patent specifications as embodiments of the invention. Bosch does not cite a single piece of evidence to show that it would have required undue experimentation for a person of skill in the art to use any of the identified sensors in connection with the claimed woodworking machines. (See RIB at 16-20.) Bosch relies on a D2M design proposal that lists these sensors among those “reviewed” during its development of active injury mitigation technology, but the proposal does not describe the level of experimentation—routine, undue, or otherwise—that would be required to use the sensors to detect a dangerous condition in a woodworking machine. (See RIB at 17, n. 16 (*citing* RX-141C.9, 17, 33).) Bosch did not ask Dr. Dubowsky any questions about the D2M document. Dr. Dubowsky did not provide any testimony about these other types of sensors that Bosch now alleges “might be considered for this task.” (*Id.* at 16.)

Bosch cites to the testimony of Dr. Gass for the proposition that Dr. Gass did not believe ultrasonic sensors would work. However, just because Dr. Gass considered and rejected “ultrasonic” sensors does not mean the claims lack enablement. First, as discussed *supra*, Dr. Gass is the inventor of the asserted patents and is not one of ordinary skill in the art. Therefore, I give his testimony little weight. Second, Bosch asserts in its brief that ultrasonic sensors are incapable of performing the claimed function of detecting a dangerous condition between a person and a cutting tool. As such, ultrasonic sensors fall outside the scope of the claims and are therefore irrelevant for purposes of deciding enablement. See *Durel Corp. v. Osram Sylvania*,

¹² Bosch’s argument focusses on a variety of sensors. However, Bosch only discussed ultrasonic sensors in its pre-hearing brief. Thus, pursuant to Ground Rule 11.2, Bosch’s reference to sensors other than ultrasonic sensors is hereby waived.

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Inc., 256 F.3d 1298, 1307 (Fed. Cir 2001) (finding certain embodiments of a coating “irrelevant to enablement because they are outside the scope of the claims”). Bosch seems to suggest that Dr. Gass should have drafted his claims to specifically exclude ultrasonic sensors, but this is not what the law requires. *See Atlas*, 750 F.2d 1569, 1576 (Fed. Cir. 1984) (“It is not a function of the claims to specifically exclude possible inoperative substances.”) (*quoting In re Dinh-Nguyen*, 492 F.2d 856, 858-59 (CCPA 1974)) (internal formatting omitted). The law requires Bosch to demonstrate that ultrasonic sensors are within the scope of the claimed invention but could not have been implemented without undue experimentation. I find Bosch has failed on both accounts. Accordingly, with regard to ultrasonic sensors, I find Bosch has failed to prove by clear and convincing evidence lack of enablement.

b. Written Description

Invalidity based on a lack of written description is a question of fact that requires proof by clear and convincing evidence. *Ariad*, 598 F. 3d at 1354. “The written description requirement is met when the disclosure ‘allow[s] one skilled in the art to visualize or recognize the identity of the subject matter purportedly described.’” *Allergan Inc.*, 796 F.3d at 1308 (*quoting Enzo Biochem, Inc. v. Gen-Probe Inc.*, 323 F.3d 956, 968 (Fed.Cir.2002)).

There is no rigid requirement that the disclosure contain either examples or an actual reduction to practice; the proper inquiry is whether the patentee has provided an adequate description that in a definite way identifies the claimed invention in sufficient detail such that a person of ordinary skill would understand that the inventor had made the invention at the time of filing.

Id. (*quoting Ariad*, 598 F.3d at 1352). That inquiry requires an objective analysis into the four corners of the specification. *Ariad*, 586 F.3d. at 1351.

I agree with SawStop that Bosch has failed to present clear and convincing testimony that would show that a person of ordinary skill in the art at the time of the invention would read the disclosures of the ‘455, ‘927, and ‘279 patents and conclude that Dr. Gass was not in possession

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of the claimed inventions. Bosch's argument is primarily built on the unsupported conclusory statements of its counsel. The evidence Bosch does cite is paltry. The only testimony Bosch cites from its expert, Dr. Dubowsky, relates to whether the specification includes an "instruction on how to build an optical detection system." (RIB at 17 (citing Tr. at 57:13-22).) That testimony, however, goes to the question of enablement, not written description. Dr. Dubowsky did not provide any testimony about whether the specification describes the invention.

Bosch also cites to testimony from Dr. Gass, the inventor of the asserted patents, to allege: (1) that Dr. Gass did not believe an optical detection system would work; and (2) that he did not possess a physical embodiment of his invention that used an optical sensor. (See RIB at 18-19.) But this testimony too is irrelevant to the written description analysis. In determining whether the written description requirement has been met "[i]t is the disclosures of the applications that count." *Allergan*, 796 F.3d at 1309 (quoting *Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565, 1571 (Fed.Cir.1997)). Testimony from Dr. Gass about what he thinks does not satisfy Bosch's obligation to produce clear and convincing evidence regarding what *a person of ordinary skill* would have understood from the disclosures.

In the end, I find Bosch has failed to meet its burden to prove by clear and convincing evidence that a person of ordinary skill in the art at the time of the invention would read the disclosures of the '455, '927, and '279 patents and conclude that Dr. Gass was not in possession of the claimed inventions.

2. Are the Asserted Claims of the '927 Patent Invalid for Insufficient Written Description and Lack of Enablement for Failure to Disclose in the Specification How to Retract All the Claimed Cutting Tools Below the Work Surface Over the Full Range of Faster than 14 Milliseconds?

Bosch argues that the asserted claims of '927 patent are invalid for lack enablement and lack of written description under the theory that the claims are not enabled through their full

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scope, because the patent specification “provides only a single example of retracting a cutting tool within approximately 14 milliseconds.” (RIB at 20-22.)

I find Bosch has waived its right to present these enablement and written description arguments. Bosch raised these arguments for the first time in Dr. Dubowsky’s supplemental expert report,¹³ served April 26, 2016. Bosch did not raise these arguments in its Validity Disclosures as required by ground rule 7.5, nor did Bosch raise them in Dr. Dubowsky’s initial expert report, even though Bosch has the burden on these issues. On May 5, 2016, I issued Order No. 14 striking these arguments from Dr. Dubowsky’s supplemental expert report. Specifically, I stated in Order No. 14, “Bosch utterly fails to explain how its new written description/enablement argument sprung from my findings in Order No. 11. Thus, I find Bosch has failed to establish good cause for the inclusion of its new written description/enablement argument.” Order No. 14 at 5. On May 16, I issued Order No. 16, striking these same arguments from Bosch’s pre-hearing brief. Order No. 16 at 2. Having had the arguments stricken from its prehearing brief, Bosch clearly cannot advance them in its post-hearing brief. *See* Ground Rule 11.2.

¹³ The parties were permitted to prepare supplemental expert reports, but only with regard to certain limitations I thought might invoke 112 para 6. Of the terms I thought might invoke § 112 ¶ 6, I found in Order No. 11 only that the terms “reaction system” in claims 8, 18, and 20 of the ‘712 patent and claims 1, 5, 7, 10, 14-16, 19, and 20 of ‘455 patent and “safety system” in claims 1 and 3 of the ‘836 patent are properly construed under 35 U.S.C. § 112 ¶ 6. Thus, any supplementation was required to be confined to those new constructions. I specifically noted in Order No. 11 with respect to both the ‘927 and ‘279 patents that “I find no basis to alter the construction I gave the [reaction system] in Order No. 7.” *See* Order No. 11 at 35-39.

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3. Are the Asserted Claims of the '279 Patent Invalid for Insufficient Written Description and Lack of Enablement for Failure to Disclose in the Specification How to Move or Accelerate All Claimed Moveable Components Over the Entire Claimed Ranges for All Claimed Cutting Tools?

Bosch argues that the asserted claims of the '279 patent are invalid for lack of enablement based on the theory that the specification “does not teach the full claimed ranges (i.e., moving the component 1/32nd of an inch within 0 milliseconds through 3 milliseconds after detection, and accelerating the component from 500 (or 2000) ft/s² to infinity.” (RIB at 23-25.)

I find Bosch has waived its right to present these enablement and written description arguments for the same reasons set forth *supra*, with respect to the '927 patent. *See* Section X.B.2, *supra*.

C. 35 U.S.C. § 103 - Obviousness

It is Bosch's burden to prove by clear and convincing evidence that the asserted claims of the asserted patents are invalid as obvious under 35 U.S.C. 103. I find Bosch has utterly failed to meet its burden and, in fact, failed to present a *prima facie* case for invalidity.

Bosch's approach to obviousness reeks of impermissible hindsight analysis. First, Bosch dissects the claims into their constituent limitations and then asserts that all the individual limitations are found in the prior art. However, “[a] patent composed of several elements is not proved obvious by merely demonstrating that each of its elements was, independently, known in the prior art.” *KSR*, 550 U.S. at 418. “The determination of obviousness is made with respect to the subject matter as a whole, not separate pieces of the claim.” *Sanofi-Synthelabo v. Apotex, Inc.*, 550 F.3d 1075, 1086 (Fed. Cir. 2008); *see also Ruiz v. AB Chance Company*, 357 F.3d 1270, 1275 (Fed. Cir. 2004) (“The ‘as a whole’ instruction in title 35 prevents evaluation of the invention part by part. Without this important requirement, an obviousness assessment might break an invention into its component parts (A + B + C), then find a prior art reference

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containing A, another containing B, and another containing C, and on that basis alone declare the invention obvious.”). Bosch never addresses any of the asserted claims as a whole. In fact, nowhere in the entirety of Bosch’s obviousness analysis does Bosch ever explicitly state a combination of references it believes renders any of the asserted claims obvious.

Second, Bosch fails to provide a clear explanation of how the individual limitations are allegedly shown in the cited prior art. Bosch contends that it is undisputed that the content and scope of the prior art discloses a number of limitations of the asserted claims of the patents-in-suit, but Bosch provides no explanation of where in the prior art these limitations are taught. Instead, Bosch string cites to the individual prior art references and provides the same 40 page block citation to the record for each limitation. (*See, e.g.*, RIB at 30-32 n45-52.) For example, Bosch alleges that each of its cited references discloses “a detection system adapted to detect a dangerous condition between a person and the working portion by imparting an electric signal to the working portion and monitoring the electric signal for at least one change indicative of the dangerous condition” as recited in the claims of the ‘712 patent, but provides no specific showing of how the references impart a signal onto a blade or monitor the signal for changes representing a dangerous condition. *See* RIB at 31 n48. Likewise, Bosch provides no particularized showing of how the prior art references allegedly disclose the self-test and single-use component limitations of the ‘455 patent, or the speed and acceleration values of the ‘927 and ‘279 patents. It is not the province of the ALJ to analyze the entirety of the record and identify with particularity how and why the allegedly disclosed claim elements are disclosed in the prior art. That is the responsibility of the party challenging the patents. *Motorola Mobility, LLC v. Int’l Trade Comm’n*, 737 F.3d 1345, 1350-51 (Fed. Cir. 2013) (“Neither the administrative law judge, nor the Commission, nor this court has the task of divining an

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invalidity defense from the record. At all times, the burden of persuasion rests on the party challenging the patent.”).

Third, Bosch rests on the conclusory assertions of its expert that it would have been a “design choice” or “common sense” to supply important (*i.e.*, non-trivial) claim elements that are missing from the prior art. The Federal Circuit’s recent opinion in *Arendi S.A.R.L. v. Apple Inc.* is instructive on this point. 2016 WL 4205964, at *4–5 (Fed. Cir. Aug. 10, 2016). In pertinent part, the opinion states:

“Obviousness is a question of law based on underlying findings of fact.” *In re Kubin*, 561 F.3d 1351, 1355 (Fed. Cir. 2009). A patent is obvious “if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a) (2012). In reaching this conclusion, the court must avoid “hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421, 127 S.Ct. 1727, 167 L.Ed.2d 705 (2007). Though less common, in appropriate circumstances, a patent can be obvious in light of a single prior art reference if it would have been obvious to modify that reference to arrive at the patented invention. *See, e.g., Takeda Chem. Indus., Ltd. v. Alphapharm Pty, Ltd.*, 492 F.3d 1350, 1357 (Fed. Cir. 2007); *SIBIA Neurosciences, Inc. v. Cadus Pharm. Corp.*, 225 F.3d 1349, 1356 (Fed. Cir. 2000).

The single question at issue here is whether the Board misused “common sense” to conclude that it would have been obvious to supply a missing limitation in the Pandit prior art reference to arrive at the claimed invention. It is true that common sense and common knowledge have their proper place in the obviousness inquiry. We stated in *Perfect Web* that “[c]ommon sense has long been recognized to inform the analysis of obviousness if explained with sufficient reasoning.” 587 F.3d at 1328. And we stated in *Randall* that “[i]n *KSR*, the Supreme Court criticized a rigid approach to determining obviousness based on the disclosures of individual prior-art references, with little recourse to the knowledge, creativity, and common sense that an ordinarily skilled artisan would have brought to bear when considering combinations or modifications.” *Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013) (citing *KSR*, 550 U.S. at 415–22, 127 S.Ct. 1727); *see also DyStar*, 464 F.3d at 1367. Hence, we do consider common sense, common wisdom, and common knowledge in analyzing obviousness.

But there are at least three caveats to note in applying “common sense” in an obviousness analysis. First, common sense is typically invoked to provide a known *motivation to combine*, not to supply a missing claim limitation. In *DyStar*,

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a pre-KSR case, we held a patent obvious where “all claim limitations [were] found in a number of prior art references,” 464 F.3d at 1360, and a person of ordinary skill in the art would have combined the references to achieve a “cheaper, faster, and more convenient” process. *Id.* at 1371 (quoting *Sandt Tech., Ltd. v. Resco Metal & Plastics Corp.*, 264 F.3d 1344, 1355 (Fed. Cir. 2001)). We stated that: “an implicit motivation to combine exists not only when a suggestion may be gleaned from the prior art as a whole, but when the ‘improvement’ is technology-independent and the combination of references results in a product or process that is more desirable.” *DyStar*, 464 F.3d at 1368. Similarly, in *Randall*, we invoked common sense to vacate the Board’s determination of non-obviousness where “the Board failed to consider a wealth of well-documented knowledge that is highly material to evaluating the motivation to combine references.” *Randall*, 733 F.3d at 1356. There, the Board’s decision to ignore the existence of a “prevalent, perhaps even predominant method” of achieving the limitation at issue was prejudicial error. *Id.* at 1363.

Second, in *Perfect Web*, the only case Appellees identifies in which common sense was invoked to supply a limitation that was admittedly *missing* from the prior art, the limitation in question was unusually simple and the technology particularly straightforward. “The patented invention involves comparing the number of successfully delivered e-mail messages in a delivery against a predetermined desired quantity, and if the delivery does not reach the desired quantity, repeating the process of selecting and e-mailing a group of customers until the desired number of delivered messages has been achieved.” *Perfect Web*, 587 F.3d at 1326. There, the missing claim limitation—step D of steps A–D—was nothing more than an instruction to repeat steps A, B, and C until a particular quantity of email was sent in accordance with the claim. By contrast, the missing search at issue here “plays a major role in the subject matter claimed” and “affects much more than step (i).” Appellant’s Br. 24. That is—if the search in step (i) is missing, then “the claims would be almost void of content” because the premise of the patent is to use information in a first program to find related information in a second program. *Id.* at 25. Thus, the facts in *Perfect Web* are distinguishable from the case at bar and ought to be treated as the exception, rather than the rule.

Third, our cases repeatedly warn that references to “common sense”—whether to supply a motivation to combine or a missing limitation—cannot be used as a wholesale substitute for reasoned analysis and evidentiary support, especially when dealing with a limitation missing from the prior art references specified. Indeed, we stated that although there is no problem with using common sense “without any specific hint or suggestion in a particular reference,” the Board’s “utter failure to explain the ‘common knowledge and common sense’ on which it relied” is problematic. *DyStar*, 464 F.3d at 1366 (explaining our reasoning in *In re Lee*, 277 F.3d 1338, 1341, 1344 (Fed. Cir. 2002)). *See also In re Zurko*, 258 F.3d 1379, 1383, 1385 (Fed. Cir. 2001) (reversing Board where it adopted examiner’s unsupported assertion that claim limitation missing from cited references was “basic knowledge” and it “would have been nothing more than good common sense” to combine the references).

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For example, in *In re Lee*, the Board adopted the examiner's statements during prosecution that combining two prior art references to achieve the claimed invention—a method of automatically displaying the functions of a video display device and demonstrating how to select and adjust the functions—would have been obvious to a person of ordinary skill. The examiner had stated that the combination would have been obvious “since the demonstration mode is just a programmable feature which can be used in many different devices for providing automatic introduction by adding the proper programming software,” and that “another motivation would be that the automatic demonstration mode is user friendly and it functions as a tutorial.” *In re Lee*, 277 F.3d 1338, 1341 (Fed. Cir. 2002). We vacated the Board's decision, holding that “[c]onclusory statements such as those here provided do not fulfill the agency's obligation” to explain all material facts relating to a motivation to combine. *Id.* at 1344.

In *Hear-Wear*, a more recent case and one that involves a missing limitation, we stated that “the Board was correct to require record evidence to support an assertion that the structural features of claims 3 and 9 of the '512 patent were known prior art elements. The patentability of claims 3 and 9 with the limitation ‘a plurality of prongs that provide a detachable mechanical and electrical connection’ presents *more than a peripheral issue*.” *Hear-Wear*, 751 F.3d at 1365 (emphasis added). We distinguished *KSR*, finding that “the present case does not present a question” regarding “combining or modifying references” but “[i]nstead, it is about whether the Board declined to accept a conclusory assertion from a third party about general knowledge in the art without evidence on the record, particularly where it is *an important structural limitation that is not evidently and indisputably* within the common knowledge of those skilled in the art.” *Id.* at 1365–66 (emphasis added and deleted). Based on this prior precedent, we conclude that while “common sense” can be invoked, even potentially to supply a limitation missing from the prior art, it must still be supported by evidence and a reasoned explanation. In cases in which “common sense” is used to supply a missing limitation, as distinct from a motivation to combine, moreover, our search for a reasoned basis for resort to common sense must be searching. And, this is particularly true where the missing limitation goes to the heart of an invention.

Id. Accordingly, while “common sense” can be invoked it must still be supported by evidence and a reasoned explanation. And in cases such as this in which “common sense” is used to supply a missing limitation the “search for a reasoned basis for resort to common sense must be searching.” Here the bases relied on by Bosch are entirely conclusory and devoid of explanation.

Fourth, I find Bosch identifies no motivation or rationale for modifying or combining the prior art. *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1164 (Fed. Cir. 2006) (“The first requirement, the motivation to combine references, serves to prevent hindsight bias.”) “The

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presence or absence of a motivation to combine references in an obviousness determination is a pure question of fact.” *Alza Corp. v. Mylan Labs., Inc.*, 464 F.3d 1286, 1289 (Fed.Cir.2006) (quoting *In re Gartside*, 203 F.3d 1305, 1316 (Fed.Cir.2000)). In *KSR*, the Supreme Court determined that the Federal Circuit had applied its “teaching, suggestion, or motivation” test too rigidly, but it reaffirmed that a conclusion of obviousness requires “an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 1741. Quoting the Federal Circuit’s decision in *In re Kahn*, the Supreme Court explained, “there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.*

Fifth, there is no evidence showing the alleged prior art combinations or modifications would produce a “reasonable expectation of success.” As the party challenging patent validity, Bosch has the burden to demonstrate by clear and convincing evidence that a skilled artisan would have not only been motivated to combine the teachings of the prior art references to achieve the claimed invention, but also that the skilled artisan would have had a reasonable expectation of success in doing so. *ActiveVideo Networks v. Verizon Comm.’s*, 694 F.3d 1312, 1327 (Fed. Cir. 2012).

Finally, as will be discussed in more detail below, SawStop presented very strong evidence with respect to the objective indicia of non-obviousness. “The objective indicia of non-obviousness play an important role as a guard against the statutorily proscribed hindsight reasoning in the obviousness analysis.” *WBIP, LLC v. Kohler Co.*, 2016 WL 3902668, at *5 (Fed. Cir. July 19, 2016)

1. Objective Indicia of Non-Obviousness

Although Bosch recognizes in its brief that “it is undisputed that SawStop has won many awards and received significant praise for their products,” Bosch nevertheless contends that

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“there is not evidence—either documentary or testimonial—to demonstrate a nexus between the awards or praise and the novel features of the asserted claims—the inclusion of a motion detection system, a self-test system, and the arbitrary numerical parameters.” (RIB at 54.) As discussed in more detail below, I find Bosch’s argument not persuasive and contrary to the evidence of record. As stated above, I find the evidence of secondary considerations in this case to be very strong.

The asserted claims of the patents-in-suit are commensurate in scope with SawStop’s products—e.g., the SawStop products are woodworking machines with a detection system, reaction system, control system, motion detection system, and self-test system that meet the claimed performance parameters. *See, e.g.*, Tr. at 478:2-482:6, 482:7-489:5, 489:6-493:15, 494:24-500:11, 500:22-506:24. Because the SawStop products embody the combination of elements that constitute the asserted claims as a whole, the awards, industry praise, skepticism, and commercial success of these products are presumed to result from the patented invention. *J.T. Eaton & Co. v. Atlantic Paste & Glue Co.*, 106 F.3d 1563 (Fed. Cir. 1997) (“When a patentee can demonstrate commercial success, usually shown by significant sales in a relevant market, ***and that the successful product is the invention disclosed and claimed in the patent***, it is presumed that the commercial success is due to the patented invention.”) (emphasis added). The fact that SawStop’s products are a direct commercial embodiment of the inventions claimed in its patents distinguishes this case from those cited in Bosch’s brief. Bosch has put forth zero evidence to rebut the presumption of a nexus between the commercial success of SawStop’s products and the patented invention. Accordingly, I find the nexus requirement is met with respect to each objective indicia of non-obviousness.

a. Recognition and Praise

SawStop and Dr. Gass have received significant recognition and praise for the claimed

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inventions and for SawStop products incorporating the claimed inventions. SawStop and Dr. Gass have received the following awards and endorsements, each of which is tied directly to its safety technology, including the following:

“The International Woodworking Fair’s Challengers Award”—the woodworking industry’s highest honor, which recognizes “new, revolutionary, creative, ingenious, or forward-thinking technology” for the woodworking industry—at the 2000 International Woodworking Fair in Atlanta, Georgia.

CX-065; CX-095.

The Woodwork Institute of California’s endorsement: “As a Trade Association in the construction industry (representing over 250 manufacturers of architectural millwork with an excess of 4,000 employees, all of whom use saws of one type or another) we find your SawStop technology and its potential of eliminating or reducing worker injury of extreme significance. Generally, we would not endorse a commercial product; however the potential benefit to our members and their employees of implementing the SawStop technology on the tools used within our industry overrides such.”

CX-256. *See also* Tr. at 222:13-230:6; CX-22.

The evidence shows that in July 2001, SawStop received the Consumer Product Safety Commission (CPSC)’s Chairman’s Commendation, which was presented for “developing innovative safety technology for power saws to prevent finger amputations and other series injuries.” CX-22. In presenting the award, Chairman Brown highlighted the reaction time of the SawStop technology and its ability to mitigate injuries: “I first saw a demonstration of the innovation at our product safety circle conference in Oak Brook, Illinois, last month. I can tell you that everyone in the room gasped when the saw stopped. In the dramatic demonstration, the saw stopped instantly when it came into contact with a hot dog. In real life, that would have been a finger – a finger that might otherwise have been amputated if the saw had not stopped. ... Dr. Gass, you have designed technology that will help prevent serious injuries from power saws. Our chief engineer Hugh McLaurin tells me your technology is sophisticated, robust and intelligently designed, while being simple in its components and use. ... It is truly a marvelous

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innovation.” *Id.*

Prior to awarding SawStop the Chairman’s Commendation, the evidence shows that the CPSC had conducted an extensive evaluation of SawStop’s prototype. CX-259. A report dated July 19, 2001 details the evaluation, highlighting the overall safety technology as well as many features recited in the asserted claims, including the quick reaction time, self-test features, rotation sensing, and retraction of the saw blade. *Id.* For example, the CPSC identified “several self-tests designed into the circuitry to ensure that safety mechanism will work if need. If any of these self-tests fail, the saw will either stop if running or will not start if not running.” CX-259.4-6. The CPSC also identified the prototype’s motion detection ability, describing that “the Hall sensor detects motion of the saw blade. This is used to allow protection during a shutdown of the saw. The electronics is capable of activating the saw brake as long as the saw blade is rotating, even after the saw is turned off.” *Id.* After evaluating the SawStop prototype and features detailed above, the report concludes:

Based upon the evaluation reported here, it appears that the SawStop concept is valid and the prototype impressively demonstrates its feasibility. The electrical and mechanical components operated without failure in a time frame that would greatly reduce blade contact injury. The design concept is very flexible and can be modified to address foreseeable areas of concern.

Id.

The CPSC’s report also states that “[t]he plastic pawl begins to stop the saw blade rotation within milliseconds of when the detection circuitry senses human contact.” CX-259.4. In addition, the CPSC report observes that “[t]he reaction time of the SawStop system is too fast for the human eye to detect...A typical SawStop reaction to contact with a hot dog resulted in almost immediate retraction of the blade and cessation of the blade rotation within 4 ms.” CX-

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259.5. The evidence suggests that the speed of the system is therefore another element that contributed to the praise and awards given to the SawStop products. CX-255 (“a safety system that is capable of stopping a rotating bade instantly”); CX-268 (“The blade is immediately stopped by a special brake within a few milliseconds...”); *see also* CX-257 (“I can tell you that everyone the room gasped when the saw stopped. In the dramatic demonstration, the saw stopped instantly when it came into contact with a hotdog.”).

The evidence shows SawStop and Dr. Gass have received dozens of other awards through the years. *See* CX-022; CX-260; CX-265; CX-269. They have also received similar recognition and praise from industry leaders and even their own competitors. In a July 14, 2001 Washington Post article titled, *Safety Isn’t Always Top Priority*, Scott Box—who was then Manager of Product Development for Delta Machinery—stated, “Safety wise, it is probably one of the most innovative features I’ve seen in the last 20 years.” CX-268. In the same article, Peter Domeny—then Director of Product Safety for SB Power Tool Co.—described SawStop’s technology as “probably one of the most major developments in the area of product safety applicable for table saws.” *Id.*; CX-261. As another example, the editor of an industry publication titled *Plastics Machining & Fabricating* stated in an editorial that he was “floored” by a demonstration of SawStop’s safety technology at the 2000 International Woodworking Fair (IWF). CX-255 (“I spoke to a couple of independent ‘experts’ at the show and neither could do anything but praise the entire concept. The technology is practical and appears to be foolproof.”); *see also* CX-266.

b. Long Felt But Unresolved Need

The evidence adduced at the hearing demonstrates that, at the time of the invention, there was a long-felt but unresolved need for enhanced safety features in woodworking machines. A July 19, 2001 report by the CPSC evaluating SawStop’s prototype provides an overview of

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injury statistics prevalent at the time. CX-259; *see also* CX-258, CX-254. In addition to providing statistics, these reports analyze “Addressability” of the injuries and concluded that table-saw based injuries had a high “maximum addressable cost estimate,” on the order of \$2 billion, and therefore represented a fertile area for injury prevention. CX-254 at 6-11.

The evidence of record demonstrates the SawStop technology embodied in the Asserted Patents resolved this need. Evidence to support this conclusion includes, as discussed above, the recognition and praise from industry participants including the CPSC, woodworkers, and SawStop’s competitors, all of whom recognized the ability of the technology to mitigate injuries. The evidence also includes “finger save” data that SawStop collects from its customers. Tr. at 288:8-298:9; CX-1; CX-434, CX-453, CX-454, CX-457, CX-458, CX-485. The evidence details 3,454 finger saves between March 2005, around the time the technology came on the market, and December 2015. *Id.* Pivot tables in the spreadsheet demonstrate that 94% of the finger saves involved first-aid treatment or less, only 6% involved a doctor visit, only 3% required stitches, and 0% resulted in amputation. *Id.*

Along with the convincing finger save data, SawStop’s customers have provided thousands of testimonials regarding the circumstances surrounding each save. Tr. at 288:8-298:9; CX-1; CX-434, CX-453, CX-454, CX-457, CX-458, CX-485. These testimonials demonstrate the effectiveness of SawStop’s technology at addressing the long-felt need for improved safety technology. The evidence shows that without the SawStop technology, it is likely most if not all of these injuries would have been far more serious. *Id.* The finger save information also demonstrates the importance of specific features recited in the asserted claims. For example, some of the finger saves occur during coast down of the saw blade. CX-435.10-11.

Additional evidence of a long-felt but unresolved need is demonstrated by the fact that

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the most common safety feature available at the time of the invention was a blade guard. *See, e.g.,* JX-016 at 1:36-46; CX-513 (Minutes from the December 8, 1999 CPSC Meeting, “PTI believes the current spreader guard is the best possible guard for most thru cuts. Education is the only way to affect the injury hazard patterns seen.”). The evidence suggests that the key problem with guard technology was that it was frequently disabled or removed by the saw operator and of only limited effectiveness to eliminate injury. CX-253.3 (“CPSC staff has identified several characteristics of traditional blade guard systems that are likely to hinder table saw use and motivate consumers to remove them to make performing a cut simpler or easier.”). As a result, the evidence establishes there was an additional long-felt need but unresolved need for safety technology that (1) did not interfere with the operator while he was using the saw, such that he or she would be motivated to remove the safety equipment, (2) eliminated the potential for injury if the safety equipment were disabled or removed, and (3) offered more effective protection than guards. The evidence demonstrates that the SawStop technology resolved these needs. The evidence shows the SawStop technology is designed so its detection, reaction, rotation-sensing, and self-test systems do not interfere with an operator during normal use. Tr. at 195:2-7, 208:1-209:5, 556:25-558:2. Further, as discussed *supra*, with regard to SawStop’s Domestic Industry Products, by virtue of monitoring rotation of the saw blade and conditioning activation of the safety system on whether the blade is spinning or in coast-down, the SawStop technology allows for normal, uninhibited operation of the saw when the blade is not moving. Additionally, the SawStop technology includes self-check mechanisms that ensure proper operation of the safety equipment and disable the motor to prevent operation of the saw if the safety system is not intact.

c. Skepticism and Unexpected Results

At the time of the invention, the evidence suggests that there was skepticism that active safety technology could be designed successfully to mitigate injuries resulting from table saw

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accidents. The July 19, 2001 report by the CPSC that evaluated SawStop's prototype demonstrates the conventional wisdom at the time of the invention, *i.e.*, that it was not possible to avoid the danger posed by a spinning saw blade. CX-259.2 ("The most effective measures are those that design the hazard out of the product. This has not been possible with tablesaws; the operational requirements of tablesaws seem to preclude the possibility of removing the hazard."). The evidence shows that others in the industry expressed skepticism that, even if it were possible to remove the danger of the spinning saw blade, "it was too late" to take mitigating action after an operator had come into contact with the blade. Dr. Gass testified about how he was met with this type of skepticism during early promotion of the SawStop technology. JX-21C at 25:15-26:8. The CPSC's initial impression of the SawStop technology reflects the same concern, describing the technology as "potentially vulnerable," because "[t]iming is everything; the blade begins to cut into the operator's finger before the system can work, and it must work reliably and very quickly to limit the injury." CX-259.2.

The evidence demonstrates that SawStop's technology met this skepticism and with praiseworthy results. After conducting a full evaluation of the SawStop technology, the CPSC concluded that SawStop's technology worked reliably and quickly enough to limit injury. *Id.* at 1-7. And with respect to reliability, the CPSC report highlighted SawStop's self-test and rotation-sensing features. *Id.* at 4 ("There are several self-tests designed to ensure that the safety mechanism will work if needed. If any of these self-tests fail, the saw will either stop if running or will not start if not running. [T]he Hall sensor detects motion of the saw blade. This is used to allow protection during a shut down of the saw. The electronics is capable of activating the saw brake as long as the saw blade is rotating, even after the saw is turned off."). Reactions from other industry participants demonstrate that SawStop was able to achieve praiseworthy results.

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As discussed above, Scott Box from Delta Machinery described the SawStop technology as follows: “Safety wise, it is probably one of the most innovative features I’ve seen in the last 20 years.” CX-268.1. Mr. Domeny likewise considered it “probably one of the most major developments in the area of product safety applicable for table saws.”¹⁴ *Id.*

d. Commercial Success

The evidence shows that SawStop has enjoyed considerable commercial success owing to the fact that its table saws incorporate the inventions of the asserted claims. Each of SawStop’s ICS, PCS, CNS, and JSS table saws practices multiple claims of each Asserted Patent. The evidence shows that in 2014, SawStop sold []

Order No. 10. SawStop’s sales grew in 2015, with sales of []

[] *Id.* During his deposition, Dr. Gass explained that SawStop’s safety technology is a but-for reason for the company’s commercial success, and that the company would not exist were it not for the technology. JX-021C at 121:6-22. The evidence suggests it is SawStop’s patented technology that differentiates SawStop from other table saws on the market and drives consumer demand for enhanced safety features. As discussed, *supra*, in addition to practicing the claims as a whole, each SawStop product includes specific claimed features (*e.g.*, rotation sensing as claimed in the ‘712 patent, self-testing and single-use components as claimed in the ‘455 patent, and a saw that reacts to a dangerous condition fast enough to mitigate injury as claimed in the ‘927 and ‘279 patents) that the evidence shows are important to the success and praise of the SawStop products.

¹⁴ I take notice that Delta Machinery was at the time (and still is) a major manufacturer of table saws and other woodworking equipment sold in the United States, including the Delta UNISAW, an industry leader and standard setter.

PUBLIC VERSION**2. The '712 Patent**

Bosch acknowledges that there are differences between the prior art upon which it relies and the claimed inventions of the '712 patent. In particular, Bosch admits that the prior art upon which it relies fails to disclose the following limitations of the asserted claims:

- A motion detection system that includes an electrical sensor, which is adapted to detect motion of the working portion/blade and to disable the reaction system when the working portion/blade is not moving/spinning. ('712 Patent, Claims 8, 9, 11, and 15)
- A control system adapted to trigger the reaction system if the dangerous condition is detected during coast-down of the cutting tool after the motor is turned off and to deactivate the reaction system after coast-down. ('712 Patent, Claim 18)
- A control system adapted to re-activate the reaction system when the motor starts spinning the cutting tool after deactivation of the reaction system. ('712 Patent, Claim 20)

(RIB at 35.) Bosch does not assert that any of these limitations are disclosed even in part in the prior art of record, let alone that any of these limitations are disclosed in their entirety.

Despite the fact that Bosch admits the prior art fails to disclose the “motion detection system” and “control system” limitations found in the asserted claims of the '712 patent, Bosch still contends that:

the unrebutted expert testimony shows that, at the time of the invention, (1) a POSITA would have known to design the system to include a motion detection system to solve the problem of undesirable (and potentially dangerous) activations when the working portion poses no danger, (2) a POSITA would have known of electrical sensors capable of performing this function, and (3) there was nothing unconventional about the use of such a sensor.

(RIB at 36 (internal footnotes omitted).)

Bosch relies on the “common knowledge”/ “common sense” of one of ordinary skill in the art to plug the holes missing from its cited prior art. As previously discussed, the Federal Circuit has made clear that “in cases such as this in which ‘common sense’ is used to supply a missing limitation the ‘search for a reasoned basis for resort to common sense must be

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searching.” *Arendi S.A.R.L.*, 2016 WL 4205964 at *5. Because the bases relied on by Bosch are incomplete, conclusory, and devoid of any particularized explanation, my search for a reasoned basis for resort to “common sense” comes up empty. For the reasons discussed *supra*, as well as those discussed in more detail below, I find Bosch has plainly failed to establish the obviousness of any of the asserted claims of the ‘712 patent by clear and convincing evidence.

Bosch offered at the hearing expert testimony from Dr. Dubowsky in support of its allegation that the asserted claims of the ‘712 patent are invalid as obvious. For example, Dr. Dubowsky testified:

“The objective is to mitigate the danger of a person coming in contact with the moving blade. And the – there is downside consequences of activating the safety system, which we’ve discussed which will result in taking the machine offline and possibly requiring repairs, replacement of saw blades, for example, in this system described here. So you don’t want to – if the blade is not moving, then there’s no hazard for the system to react to. So they’re preventing inadvertent reactions of the system with its disadvantages.”

Tr. at 88:18-89:9. Dr. Dubowsky fails to address the entire claim limitation. The “motion detection system” of claim 8 requires that the “reaction system” is kept enabled while the blade is still moving even if the motor has been turned off. *See* JX-016 at 12:48-50, 14:10-16.

Nowhere does Dr. Dubowsky address this requirement or provide a motivation or rationale that would lead a person of ordinary skill in the art towards the requirement, as opposed to some other direction, such as simply unplugging the saw after it has come to a stop. With respect to the “control system” of claim 18, Dr. Dubowsky’s testimony was similarly devoid of analysis:

Q. And in particular, this claim specifies that the “control system is adapted to trigger the reaction system if the dangerous condition is detected when the motor is spinning the cutting tool or during coast-down of the cutting tool after the motor is turned off and to deactivate the reaction system after coast-down.”

Do you have an opinion about whether one of ordinary skill in the art in 1999 would have considered the invention of claim 18 to be obvious?

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A. Yes.

Q. And your opinion is?

A. It would be obvious.

Tr. at 91:17-92:3. Such conclusory testimony cannot support a finding of obviousness, let alone rise to the level of clear and convincing evidence concerning the same. *See, e.g., Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1373-74 (Fed. Cir. 2008); *Telemac Cellular Corp. v. Topp Telecom, Inc.*, 247 F.3d 1316, 1329 (Fed. Cir. 2001).

Furthermore, at no point did Dr. Dubowsky provide any particularized evidence to support a rationale for modifying the references upon which SawStop relies—namely, Nieberle, Sorensen, Hughes, Yoneda, Friemann, Lokey, Citroen, Salmont—to include the “motion control system” of claim 8 or the “control system” of claim 18 such that any of these references would render obvious any asserted claim of the ‘712 patent “as a whole,” as would be required for a finding of obviousness. *ActiveVideo Networks v. Verizon Comms.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012) (affirming finding of non-obviousness where, “The expert failed to explain how specific references could be combined, which combination(s) of elements in specific references would yield a predictable result, or how any specific combination would operate or read on the asserted claims. ... This is not sufficient and is fraught with hindsight bias.”); *Innogenetics*, 512 F.3d at 1374 (“some kind of motivation must be shown from some source, so that the [finder of fact] can understand why a person of ordinary skill would have thought of either combining two or more references or modifying one to achieve the patented method.”)

3. The ‘455 Patent

Bosch acknowledges that there are differences between the prior art upon which it relies and the claimed inventions of the ‘712 patent. In particular, Bosch admits that the prior art upon which it relies fails to disclose the following limitations of the asserted claims:

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- A control system configured to determine the operability of the reaction system (or a portion of the reaction system) while the motor is running without having to operate the reaction system and to disable the motor if the reaction system is inoperable. ('455 Patent, Claims 1, 16)
- A reaction system that includes at least one replaceable single-use component and a control system to test the single-use components, where the control system is configured to disable the motor until the single-use component has been replaced. ('455 Patent, Claim 5)

(RIB at 35.) Bosch does not assert that any of these limitations are disclosed even in part in the prior art of record, let alone that any of these limitations are disclosed in their entirety.

Bosch admits that “[t]he difference between asserted claims 1, 10, and 16 of the ‘455 patent and the prior art documents is the addition to an active safety system of a control system configured to determine the operability of the reaction system (or a portion of the reaction system) while the motor is running without having to operate the reaction system and to disable the motor if the reaction system is inoperable.” (RIB at 39.) However, Bosch contends the “control system” missing from the prior art would have been “a common sense addition to the structures explicitly described in the prior art.” *Id.*

Bosch relies on the “common sense” of one of ordinary skill in the art to plug the holes missing from its cited prior art. As previously discussed, the Federal Circuit has made clear that “in cases such as this in which ‘common sense’ is used to supply a missing limitation the ‘search for a reasoned basis for resort to common sense must be searching.’” *Arendi S.A.R.L.*, 2016 WL 4205964 at *5. Because the bases relied on by Bosch are incomplete, conclusory, and devoid of any particularized explanation, my search for a reasoned basis for resort to “common sense” comes up empty. For the reasons discussed *supra*, as well as those discussed in more detail below, I find Bosch has plainly failed to establish the obviousness of any of the asserted claims of the ‘455 patent by clear and convincing evidence.

The only evidence that Bosch offers for its assertion that the missing “control system”

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would have been “a common sense addition” is the conclusory testimony of its expert, Dr. Dubowsky, who stated that it would be common sense to add the claimed “control system” to avoid “impart[ing] a false sense of security to the user if the safety system were inoperable.” (RIB at 39 (citing Tr. at 93:21-94:6).) Dr. Dubowsky cites to no evidence anywhere to support a finding that a user of a table saw spinning at approximately 4,000 rpm would feel secure putting any part of their body near the blade if the table saw had an active injury mitigation system. *See* Tr. at 93:21-94:6. Neither Dr. Dubowsky, nor Bosch, identify any prior art document reflecting such a false sense of security, nor do they offer any evidence of users prospectively feeling this way. Dr. Dubowsky merely makes a conclusory statement, which Bosch proclaims as un rebutted evidence. As discussed above, such a wholly unsupported conclusory assertion is not evidence. *Telemac*, 247 F.3d at 1329. Moreover, the record evidence actually contradicts Dr. Dubowsky’s “false sense of security” testimony. In particular, Bosch’s corporate witness, Eric Laliberte, testified that “[i]t’s hard to make yourself put your fingers near a spinning blade, yes.” Tr. at 803:2-4.

Additionally, Bosch offers no evidence that any of the prior art upon which it relies discloses a reaction system that uses a replaceable single-use component as recited in claim 5, let alone provides a rationale for one of ordinary skill in the art to (1) modify a prior art reference to use a single-use component and (2) then further modify the reference to implement a self-test system for testing this single use component without operating the component. *See* RIB at 39-41; Tr. at 94:14-95:8. Dr. Dubowsky’s opinions are particularly suspect here as he offered no explanation as to why a person skilled in the art would seek to modify any of the cited prior art with a single-use component, much less with a reasonable expectation that doing so would be successful. Such conclusory assertions cannot be clear and convincing evidence of the

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obviousness of claim 5. *ActiveVideo*, 694 F.3d at 1327.

Finally, I note that Bosch offers no evidence regarding how any specific prior art reference upon which it relies would be combined with another reference, or otherwise modified, to meet each and every limitation of asserted claims 1, 5, 10 and 16 of the '455 patent. (See RIB at 39-41.)

4. The '927 Patent

Bosch acknowledges that there are differences between the prior art upon which it relies and the claimed inventions of the '712 patent. In particular, Bosch admits that the prior art upon which it relies fails to disclose the following limitations of the asserted claims:

- “where the reaction system is configured to retract the cutting tool below the work surface within approximately 14 milliseconds after the dangerous condition is detected by the detection system” ('927 patent, claim 12)
- “where the reaction system includes an explosive.” Including an explosive in the 14 millisecond retraction reaction system. ('927 patent, Claim 12).

(RIB at 35.) Bosch does not assert that any of these limitations are disclosed even in part in the prior art of record, let alone that any of these limitations are disclosed in their entirety. Nor does Bosch argue that one of ordinary skill in the art at the time of the invention of the asserted claims of the '927 patent would have had a rationale for modifying any of the prior art it relies upon to including a reaction system that retracted a blade within 14 ms, let alone doing so using an explosive. Instead, Bosch asserts that “[t]he undisputed evidence shows that a 14 millisecond retraction time is arbitrary.” (RIB at 42.) According to Bosch, the 14 ms time had no technical significance and as such it appears that Bosch ignored it for purposes of establishing invalidity. (RIB at 43 (citing *In re Geisler*, 116 F.3d 1465, 1469 (Fed. Cir. 1997)).)

For the reasons discussed *supra*, as well as those discussed in more detail below, I find Bosch has plainly failed to establish the obviousness of any of the asserted claims of the '927

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patent by clear and convincing evidence.

Asserted claim 8 of the '927 patent includes a "reaction system" "configured to retract the cutting tool below the work surface within approximately 14 milliseconds after the dangerous condition is detected by the detection system." Claim 12, which depends from claim 8, further requires that "the reaction system includes an explosive." JX-019.0037. Bosch does not identify any prior art reference that discloses either of these limitations.

Bosch argues that the asserted claim 8 of the '927 patent is obvious by simply ignoring the requirement of the asserted claims that retraction occur within 14 ms after detection of a dangerous condition. (*See* RIB at 42-43 (arguing that 14 ms is arbitrary and has no technical significance).) Bosch provides no support for the proposition that it can simply ignore the specific timing requirements in the claims. Bosch cites to *In re Geisler*, but *Geisler* does not stand for this proposition. In fact, contrary to Bosch's argument, I do not find the facts of *In re Geisler* analogous. It is Bosch's burden to prove that the claim "as a whole" is obvious, which includes the specific timing requirements set forth therein. *Hybritech*, 802 F.2d at 1383 ("Focusing on the obviousness of substitutions and differences instead of on the invention as a whole ... was a legally improper way to simplify the difficult determination of obviousness."); 35 U.S.C. 103.

In a footnote, Bosch identifies two prior art references, Friemann (RX-031) and Høgsholm (RX-013), as disclosing timings within 14 ms. (RIB at 43 n90.) But neither Friemann nor Høgsholm disclose a system in which a blade is retracted. Høgsholm discloses a "blocking or cutting means 16," that blocks a user from being injured by the blade. RX-013.0003 (line 30). Friemann discloses a braking mechanism for braking the pulley or motor of

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a band cutter.¹⁵ RX-031.0007 at 3:34-4:17. And Bosch provides no evidence of record that even addresses, let alone proves clearly and convincingly, a rationale for why or how one of ordinary skill in the art would modify either Friemann or Høgsholm, or any other prior art reference of record, to retract a blade within 14 ms after a dangerous condition is detected. (RIB at 43-44.)

Bosch again resorts to reliance on individual disclosures of disparate prior art references, with no analysis from its expert establishing how or why one of ordinary skill in the art might combine the teachings of any such references, to offer a conclusory assertion that “[a]ll of the prior art documents explicitly teach to react quickly (*e.g.*, ‘instantaneously’), which—as Dr. Dubowsky explained—means appropriately fast for the particular safety system being designed.” *Id.*

With respect to asserted claim 12 of the ‘927 patent, Bosch argues that the requirement of claim 12 that a “reaction system includes an explosive” is met by “unrebutted expert testimony.” Bosch argues that “[t]he unrebutted expert testimony was that a POSITA, at the time of the invention, would have known of many different types of actuators—including explosives—and that choosing a particular actuator was merely a design choice.” (RIB at 46.). Specifically, Bosch relies on the following testimony from its expert, Dr. Dubowsky:

Q. What kinds of actuators, what can you think of that they would have thought of in that time?

[Dr. Dubowsky]: Within the normal repertoire of actuators, things like pneumatic actuators, hydraulic actuators, electromechanical actuators, *pyrotechnic actuators*, and other such elements.

¹⁵ It is interesting to note the Friemann invention was recently found not to be enabled in litigation involving Complainant and the USPTO in the U.S. District Court for the District of Columbia. See *SD3, LLC v. Dudas*, 952 F. Supp. 2d 97, 101 (D.D.C. 2013)

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Q. And how would one of ordinary skill in the art, given the task of designing a particular machine, have approached the question of selection of a proper actuator?

[Dr. Dubowsky]: That's a design choice. It's definitely a design choice. Whether or not you use a solenoid or bimetallic strip actuator depends on the range of forces you want to have and the speeds involved, the complexity, the size. Cost, reliability all go into these design choices. I can say personally I've used them all, and not all but probably most of the actuators that are mentioned and others. So I can say it's a design choice for the engineer who is a person of ordinary skill, a machinery designer who is designing these machines, to choose the actuator which would be most effective from that large set of available actuators.

Tr. at 42:10–43:6 (emphasis added). I find Dr. Dubowsky's testimony to be entirely conclusory, such that when coupled with the deficiencies of Bosch's obviousness argument with respect to claim 8, cannot rise to the level of clear and convincing evidence.

5. The '279 Patent

Bosch admits that the prior art fails to disclose the following limitations from the asserted claims of the '279 patent:

- “an actuator having stored energy sufficient to move the moveable component $1/32^{\text{nd}}$ of an inch within approximately 3 milliseconds or less after the dangerous condition is detected” (claims 1 and 16);
- “where the actuator is adapted to move the moveable component at an acceleration of over 2000 ft/s² when the detection system detects the dangerous condition” (claim 6); and
- “where the actuator is configured to move the moveable component at an acceleration of 500 ft/sec² or more” (claim 17).

(RIB at 35.) Additionally, as discussed more generally, *supra*, Bosch has failed to make any particularized showing that the other limitations from the asserted claims of the '279 patent were known in the prior art. (*Id.* at 33-34.) For example, Bosch argues that the prior art discloses a “mechanism having a moveable component” and “an actuator having stored energy sufficient to move the moveable component,” but does not identify where in the prior art these elements are

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allegedly found. (*Id.*)

Moreover, Bosch provides no evidence, or even attempts to argue, that one of ordinary skill in the art at the time of the invention of the asserted claims of the ‘279 patent would have had a rationale for modifying any of the prior art it relies upon to include an actuator and moveable component capable of meeting the performance parameters specified in claims 1, 6, 16, and 17. Instead, as with the ‘927 patent, Bosch simply argues the claimed parameters are “arbitrary” and therefore can be ignored in determining obviousness. (RIB at 49.) To support this argument, Bosch points directly to the teachings of the ‘279 patent specification, and in particular its description of specific measurements and calculations a person of ordinary skill in the art should evaluate to practice the claimed invention. (*Id.*) Bosch then cites testimony from Dr. Dubowsky arguing that each parameter would have been a “design choice” that a person skilled in the art “would obtain from his design studies.” (*Id.* at 50.) This is classic hindsight and cannot support a finding of obviousness. *Monarch*, 139 F.3d at 881 (“Defining the problem in terms of its solution reveals improper hindsight in the selection of the prior art relevant to obviousness.”).

XI. UNENFORCEABILITY - PATENT MISUSE**The Parties’ Positions**

Bosch argues Complainants have abused their right-to-exclude conferred by their patents. (RIB at 4.) Bosch contends that during the hearing, “SawStop founder Stephen Gass admitted that Complainants . . . had conditioned the grant of a license to Bosch on Bosch’s agreement to use SawStop technology on all its table saws, or in other words, on Bosch’s agreement to stop selling its much lower-priced non-infringing, preexisting saws that did not include SawStop-type technology.” (*Id.*) Bosch asserts that conditioning the grant of a license on an agreement to not

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sell a non-infringing product is textbook patent misuse. (*Id.*) Bosch argues the SawStop patents are therefore unenforceable against Bosch. (*Id.*)

SawStop argues that Bosch's patent misuse argument fails on several grounds. (CRB at 3.) SawStop argues that as an initial matter, Bosch waived its right to assert its conditional licensing patent misuse argument by failing to provide "fair notice" of the argument in its pre-hearing brief pursuant to Ground Rule 11.2. (*Id.* at 3-4.) SawStop contends that Bosch did not assert its conditional licensing-based patent misuse argument anywhere in the unenforceability section of its pre-hearing brief. (*Id.* at 4.) SawStop asserts that the only place in Bosch's pre-hearing brief where patent misuse is discussed is in a joint section stating general principles on the "Law of Unclean Hands, Patent Misuse and Prosecution Laches" and that other than that there are only vague allegations that SawStop proposed to grant licenses to its competitors and then "refus[ed] to actually enter into" such agreements. (*Id.*) Based on Bosch's failure to provide "fair notice" of its patent misuse argument in its pre-hearing brief, SawStop argues that Bosch has waived or abandoned that argument. (*Id.*)

SawStop also argues that even assuming Bosch did not waive its patent misuse argument, Bosch has failed to prove patent misuse. (*Id.*) SawStop asserts that the "key inquiry under the patent misuse doctrine is whether, by imposing the condition in question, the patentee has impermissibly broadened the physical or temporal scope of the patent grant and has done so in a manner that has anticompetitive effects." (*Id.* (citing *Princo Corp. v. Int'l Trade Comm'n*, 616 F.3d 1318, 1328 (Fed. Cir. 2010).) SawStop contends Bosch fails this inquiry. (*Id.* at 5.) SawStop argues that although Bosch alleges that SawStop demanded, as part of any licensing agreement, that Bosch "stop selling its much lower-priced non-infringing, preexisting saws that did not include SawStop-type technology," a closer examination of the record reveals that

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SawStop never made such extreme demands. (*Id.*) SawStop argues that it never imposed the onerous conditions alleged by Bosch as part of any prospective license and that asking a licensee for a commitment of some kind to sell products incorporating the licensed patent is qualitatively different from requiring a licensee to stop selling products not practicing the patented technology, or seeking royalties on sales of a licensee's non-practicing products. (*Id.* at 5-6.) SawStop argues that even on Bosch's strained reading of the evidentiary record, SawStop cannot have engaged in patent misuse because the parties ultimately never concluded a licensing agreement. (*Id.* at 6.) SawStop contends that the case law, including several cases cited by Bosch, makes clear that a finding of patent misuse requires, as a predicate, a license or other agreement entered into between parties. (*Id.*)

Given the absence of a license, SawStop contends that Bosch's argument morphs into a challenge to SawStop's ultimate decision to refuse to grant a license to Bosch. (*Id.*) SawStop argues that argument likewise fails because Congress passed the Patent Misuse Reform Act of 1988 to exempt from the scope of the patent misuse doctrine a patent owner's refusal to license its patent. SawStop argues that § 271(d)(4) shields SawStop's conduct during negotiations, and its refusal to grant a license, from a charge of patent misuse. (*Id.*)

Bosch argues in reply that it was impossible for this argument to have been waived, because it is based on an admission that Dr. Gass had never made until his lengthy discussion at the hearing of his licensing strategy. (RReplyB at 28.)

Discussion

SawStop asserts that under to my ground rules Bosch waived its patent misuse argument because it was not raised in its pre-hearing brief. Bosch argues that it could not have waived its misuse argument because it is based on an admission by Dr. Gass at the hearing. I find that

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Bosch did not present its patent misuse argument in its pre-hearing brief with the necessary level of particularity required to prevent it from being considered waived under Ground Rule 11.2. However, in light of Bosch's allegation that its patent misuse argument stems from an admission against interest made for the first time at the hearing by Dr. Gass, I will entertain Bosch's argument.

In *Princo Corp. v. Int'l Trade Comm'n*, the Federal Circuit nicely summarized the basics of patent misuse. 616 F.3d 1318 (Fed. Cir. 2010)(*en banc*). To set the landscape for my discussion, I quote the following relevant portions from the Federal Circuit's opinion in *Princo*.

Patent misuse developed as a nonstatutory defense to claims of patent infringement. In the licensing context, the doctrine limits a patentee's right to impose conditions on a licensee that exceed the scope of the patent right.

Id. at 1321.

The Court applied the same reasoning to licenses requiring the payment of licensing fees after the expiration of the licensed patent and thus having the effect of extending the life of the patent beyond the statutory period. In *Brulotte v. Thys Co.*, 379 U.S. 29, 85 S.Ct. 176, 13 L.Ed.2d 99 (1964), the Court explained that a patent "empowers the owner to exact royalties as high as he can negotiate with the leverage of that monopoly. But to use that leverage to project those royalty payments beyond the life of the patent is analogous to an effort to enlarge the monopoly of the patent by tying the sale or use of the patented article to the purchase or use of unpatented ones." *Id.* at 33, 85 S.Ct. 176.

As applied to patent licensing agreements, the Supreme Court put the matter succinctly in *Zenith*, 395 U.S. at 136, 89 S.Ct. 1562:

[T]here are established limits which the patentee must not exceed in employing the leverage of his patent to control or limit the operations of the licensee. Among other restrictions upon him, he may not condition the right to use his patent on the licensee's agreement to purchase, use, or sell, or not to purchase, use, or sell, another article of commerce not within the scope of his patent monopoly.

In our cases applying the Supreme Court's patent misuse decisions, we have characterized patent misuse as the patentee's act of "impermissibly broaden[ing] the 'physical or temporal scope' of the patent grant with anticompetitive effect." *Windsurfing Int'l, Inc. v. AMF, Inc.*, 782 F.2d 995, 1001 (Fed.Cir.1986). When the

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patentee has used restrictive conditions on licenses or sales to broaden the scope of the patent grant, we have held that an accused infringer may invoke the doctrine of patent misuse to defeat the patentee's claim. *See Monsanto Co. v. McFarling*, 363 F.3d 1336, 1341 (Fed.Cir.2004); *Va. Panel Corp. v. MAC Panel Co.*, 133 F.3d 860, 870 (Fed.Cir.1997); *Senza-Gel Corp. v. Seiffhart*, 803 F.2d 661 (Fed.Cir.1986).

Id. at 1327-28.

For the reasons discussed in more detail below, I find Bosch has failed to prove SawStop did anything that would constitute patent misuse.

Bosch's patent misuse argument is premised on its assertion that SawStop had conditioned the grant of a license to Bosch on Bosch's agreement to use SawStop technology on all its table saws. However, the record evidence when viewed in its entirety paints a different picture. The record reflects that, during licensing negotiations, SawStop merely wanted Bosch to "make a commitment to the [SawStop] technology." Tr. 307:6-7. This was because Bosch had initially appeared to want a license "with really no commitment to sell any particular number of saws, but just the right to sell them if they felt like it." *See* Tr. 305:17-307:16. Without a commitment from Bosch to make enough royalty-bearing saws, the evidence shows SawStop "d[id]n't think the benefits of licensing Bosch offset[] the costs to SawStop of a license." *See* Tr. 307:22-308:9. SawStop later seemed to have obtained a pledge from Bosch to implement the SawStop technology "on a hand-held circular saw," which was one way SawStop thought that it could "potentially offset the cost to [SawStop's] business of doing a license," but when SawStop received from Bosch a draft agreement, SawStop felt its terms also showed "essentially ... no commitment whatsoever" by Bosch. *See* Tr. 308:10-310. Thus, I find the evidence tends to show it was Bosch's inability to present terms that made business sense to SawStop that led the "deal with Bosch [to] fall through." *See* Tr. 307:20-310:1.

Incidental to the monopoly grant of a patent are the rights in the patentee to file suit to protect his monopoly, to exact royalties as high as he can negotiate with the

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leverage of his monopoly, to select the licensees who will be authorized to practice the teaching of the patent, and to consider relevant factors affecting the patentee's own business in determining to whom a license will be offered and the conditions upon which a license will be granted.

See LaSalle St. Press, Inc. v. McCormick & Henderson, Inc., 445 F.2d 84, 95 (7th Cir. 1971).

The “key inquiry under the patent misuse doctrine is whether, by imposing the condition in question, the patentee has impermissibly broadened the physical or temporal scope of the patent grant and has done so in a manner that has anticompetitive effects.” *Princo Corp.*, 616 F.3d at 1328. As discussed above, the evidence does not show that SawStop tried to impose conditions on Bosch that exceeded the scope of the patent right. To the contrary, SawStop's desire to have Bosch commit to making a certain quantity of the patented products is well within the patent grant, not outside of that grant. *See Monsanto*, 363 F.3d at 1341 (“In the cases in which the [licensing] restriction is reasonably within the patent grant, the patent misuse defense can never succeed.”); *Mallinckrodt*, 976 F.2d at 708 (“Should the restriction be found to be reasonably within the patent grant, *i.e.*, that it relates to subject matter within the scope of the patent claims, that ends the [patent misuse] inquiry.”). I agree with SawStop that asking a potential licensee for a commitment of some kind to sell products incorporating the licensed patent is qualitatively different from requiring a licensee to stop selling products not practicing the patented technology, or seeking royalties on sales of a licensee's non-practicing products.

I also observe the relevant caselaw assumes a license agreement was actually executed that limited the licensee in a prohibited manner – the context presumes a license. Here, Bosch never became a licensee of SawStop. Hence, this is yet another reason the doctrine of patent misuse cannot apply.

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XII. CONCLUSIONS OF LAW

1. The Commission has personal jurisdiction over the parties and subject-matter jurisdiction over the accused products.
2. The importation or sale requirement of Section 337 is satisfied.
3. SawStop's domestic industry products practice the asserted claims of U.S. Patent No. 7,225,712.
4. The domestic industry requirement is satisfied with respect to the '712 patent.
5. Bosch does not infringe the asserted claims of the '712 patent.
6. Bosch does not contributorily infringe the asserted claims of the '712 patent.
7. The asserted claims of the '712 patent have not been shown to be invalid.
8. There is no violation of Section 337 with respect to the '712 patent.
9. SawStop's domestic industry products practice the asserted claims of U.S. Patent No. 7,600,455.
10. The domestic industry requirement is satisfied with respect to the '455 patent.
11. Bosch does not infringe the asserted claims of the '455 patent.
12. Bosch does not contributorily infringe the asserted claims of the '455 patent.
13. The asserted claims of the '455 patent have not been shown to be invalid.
14. There is no violation of Section 337 with respect to the '455 patent.
15. SawStop's domestic industry products practice the asserted claims of U.S. Patent No. 7,895,927.
16. The domestic industry requirement is satisfied with respect to the '927 patent.
17. Bosch infringes the asserted claims of the '927 patent.
18. Bosch contributorily infringes the asserted claims of the '927 patent.
19. The asserted claims of the '927 patent have not been shown to be invalid.
20. There is a violation of Section 337 with respect to the '927 patent.
21. SawStop's domestic industry products practice the asserted claims of U.S. Patent No. 8,011,279.

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22. The domestic industry requirement is satisfied with respect to the '279 patent.
23. Bosch infringes the asserted claims of the '279 patent.
24. Bosch contributorily infringes the asserted claims of the '279 patent.
25. The asserted claims of the '279 patent have not been shown to be invalid.
26. There is a violation of Section 337 with respect to the '279 patent.

XIII. INITIAL DETERMINATION AND ORDER

Based on the foregoing,¹⁶ it is my Initial Determination that there is a violation of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain table saws incorporating active injury mitigation technology and components thereof, in connection with the asserted claims of U.S. Patent Nos. 7,895,927 and 8,011,279.

Furthermore, it is my determination that a domestic industry in the United States exists that practices or exploits each of the asserted patents.

The undersigned hereby CERTIFIES to the Commission this Initial Determination, together with the record of the hearing in this investigation consisting of the following: the transcript of the evidentiary hearing, with appropriate corrections as may hereafter be ordered; and the exhibits accepted into evidence in this investigation as listed in the appendices hereto.¹⁷

Pursuant to 19 C.F.R. § 210.42(h), this Initial Determination shall become the determination of the Commission unless a party files a petition for review pursuant to 19 C.F.R.

¹⁶ The failure to discuss any matter raised by the parties or any portion of the record herein does not indicate that said matter was not considered. Rather, any such matter(s) or portion(s) of the record has/have been determined to be irrelevant, immaterial or meritless. Arguments made on brief which were otherwise unsupported by record evidence or legal precedent have been accorded no weight.

¹⁷ The pleadings of the parties filed with the Secretary need not be certified as they are already in the Commission's possession in accordance with Commission rules.

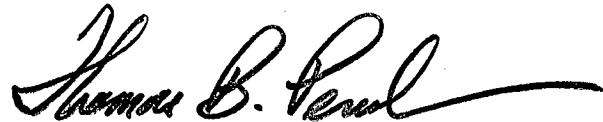
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§ 210.43(a) or the Commission, pursuant to 19 C.F.R. § 210.44, orders on its own motion a review of the Initial Determination or certain issues therein.

PUBLIC VERSION**Confidentiality Notice:**

This Initial Determination is being issued as confidential, and a public version will be issued pursuant to Commission Rule 210.5(f). Within seven (7) days of the date of this Initial Determination, the parties shall jointly submit: (1) a proposed public version of this opinion with any proposed redactions bracketed in red; and (2) a written justification for any proposed redactions specifically explaining why the piece of information sought to be redacted is confidential and why disclosure of the information would be likely to cause substantial harm or likely to have the effect of impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions.¹⁸

SO ORDERED.



Thomas B. Pender
Administrative Law Judge

¹⁸ Under Commission Rules 210.5 and 201.6(a), confidential business information includes: information which concerns or relates to the trade secrets, processes, operations, style of works, or apparatus, or to the production, sales, shipments, purchases, transfers, identification of customers, inventories, or amount or source of any income, profits, losses, or expenditures of any person, firm, partnership, corporation, or other organization, or other information of commercial value, the disclosure of which is likely to have the effect of either impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions, or causing substantial harm to the competitive position of the person, firm, partnership, corporation, or other organization from which the information was obtained, unless the Commission is required by law to disclose such information.

See 19 C.F.R. § 201.6(a). Thus, to constitute confidential business information the disclosure of the information sought to be designated confidential must ***likely have the effect of*** either: (1) impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions; or (2) ***causing substantial harm*** to the competitive position of the person, firm, partnership, corporation, or other organization from which the information was obtained.

**IN THE MATTER OF CERTAIN TABLE SAWS,
INCORPORATING ACTIVE INJURY MITIGATION TECHNOLOGY
AND COMPONENTS THEREOF**

337-TA-965

CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **RECOMMENDED DETERMINATION PUBLIC** has been served upon the following parties via first class mail and air mail where necessary on **SEP 29 2016**



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